Univ. of
Toronto
Library

BINDING LIST APR 1 5 1923

Digitized by the Internet Archive
in 2007 with funding from
Microsoft Corporation

http://www.archive.org/details/britishjournalof66londuoft

THE BRITISH JOURNAL OF PHOTOGRAPHY.

PUBLISHED WEEKLY

VOL. LXVI.

1919.

140343
12/5/23

HENRY GREENWOOD & CO., LTD., PUBLISHERS, 24, WELLINGTON STREET, STRAND, LONDON, ENGLAND.
SALES AGENTS:—UNITED STATES, GEORGE MURPHY, INC., 57, EAST NINTH STREET, NEW YORK.
CANADA: J. G. RAMSEY & CO., LTD., 66, KING STREET WEST, TORONTO. D. H. HOGG CO., 152, CRAIG STREET WEST, MONTREAL.
T. EATON DRUG CO., LTD., WINNIPEG. STEWART PHOTO SUPPLY CO., 840, PENDER STREET WEST, VANCOUVER, B.C.
AUSTRALIA: KODAK (AUSTRALASIA), LTD., BOND STREET, ABBOTSFORD, MELBOURNE. HARRINGTONS, LTD., 386, GEORGE STREET, SYDNEY. HERBERT SMALL PTY. LTD., 270, LITTLE COLLINS STREET, MELBOURNE. GORDON & GOTCH, LTD., MELBOURNE.
NEW ZEALAND: KODAK (AUSTRALASIA), LTD., DIXON STREET, WELLINGTON. HARRINGTONS (N.Z.), LTD., WILLIS STREET, WELLINGTON.
SOUTH AFRICA: LENNON, LTD., P.O. BOX 39, CAPE TOWN. INDIA: HOUGHTONS (INDIA) LTD., APOLLO STREET, FORT, BOMBAY.
JAPAN: MARUZEN CO., LTD., 11-16, NIHONBASHI TORI SANCHOME, TOKIO.

TR
1
B8
v. 66

INDEX.

Throughout the Index the following abbreviations are used to indicate the nature of the subject matter :—

(Pat.) Patent News. (Cor.) Correspondence. (Soc.) Societies' Meetings. (Rev.) Review or Trade Notice. (Ans.) Answers. (Anal.) Analecta.

The Index includes several Sub-Indexes—

Bankruptcies, Books Reviewed, Companies Registered, Deaths, Exhibitions, Names and Marks, Trade, Patents (Authors of),

which are placed in their alphabetical positions.

Subject Index.

For Names of Authors of Articles and Papers, see Authors' Index, p. VI.

A

Accident prevention, use of photographs. By G. D. Crain, Junr., 635
Acetic acid substitute in wet-plate developer (Cor.), 226
Actinometer, multiple-type, making, 46
Advertising the studio. By Practicus, 263
— photo-engraved novelties for, 355
Aerial, American, Photography Association, 342
Aerial cameras, British, progress in war-time, 139
— — evolution during war. By C. M. Williamson, 309
— — A. Brock, Junr. (Pat.), 506, 507
— — G.E.M. Engineering Co. (Pat.), 477
— — F. C. V. Laws (Pat.), 299
— — moving, E. Duerr (Pat.), 237
— — stereoscopic, D. A. English (Pat.), 535
— — Thornton-Pickard. By S. L. Hughes, 293
— — Williamson (Pat.), 323, 324
— — H. Workman (Pat.), 131
— photographs, mapping from. By M. N. MacLeod, D.S.G., 503, 518
— photographic supplies for sale, 523
— photogrammetry, present position surveyed. By Major P. R. Burchall, R.A.F., 695
— — and Ordnance Survey, 655, 685
— photography and town planning (Cor.), 18
— — angling, admissible limit, in vertical or horizontal photography. By L. P. Clerc, 297
— — correction of negatives taken obliquely. By L. P. Clerc, 396, 411, 428, 440
— — development of British lenses for, 133, 243, 264
— — during the war, 39, 148, 211, 340
— — estimating height of object by measurement of cast shadows. By L. P. Clerc, 295
— — horizon line, lowering. By L. P. Clerc, 295
— — in the future. By A. Brock and L. J. R. Holst, 87, 106
(See also *Royal Flying Corps.*)
Aerial Photos, Ltd., commercial aerial photography, 727
Aeroplane post and photography, 421
Affiliation outing to Croydon, 286, 342, 374
Air raids on London photographers' premises, 143
Airbrush in advertisement work, 88
Allies Studios, limited partnership, 478
Aluminium, soldering with Kayolin (Soc.), 609
Amateurs' work, finishing, 191
American Aerial Photography Association, 342
Amidol developer, Piper formula, 713
— v. M.Q. for bromides, 75
— Griffins (Rev.), 554
Anti-sulphuric paint for labelling bottles, 552
Apparatus, minor repairs to, 258
Appearances of studio and staff, value of, 66
Apprenticeship, report of the Edinburgh Society of Professional Photographers, 609
Artificial lighting, merits of various types. By Practicus, 59
Assistant photographers'. By D. Charles, 142
Assistants, association for (Cor.), 403, 419, 446, 462
— discussion of conditions (Cor.), 7, 18, 31, 43, 55, 63, 78, 91, 119, 135, 150, 167, 227, 643, 655, 670, 686, 703, 714
— education of, 82
— wages (Cor.), 303, 343, 358, 375
Athey and Sykes, partnership dissolved, 609

B

Baby portraits, obtaining orders, 458
Backgrounds in the portrait studio. By Practicus, 36
— natural, Elwin Neame, 482, 754
— — two early methods, 528
— on negatives, reducing, 711
— white, rear lighting, 327
Backing, quinine, for plates, 286
Ballance, G. R., removing to France, 509
Bas-relief effects in enlargements, 547

BANKRUPTCIES—

Barron, R. C., 642, 655, 713
Bramwell, J. E., 445, 579
Croft, J. P., 701
Curtis, W., 462
Empire Studios, 254, 285
Gray, M. J., 254, 285
Gray, F. W., 285
Heathcote, H. A. Y., 593, 655
Jones, H. A., 43, 194, 494
Louvre Studios, Ltd., 433, 701
Michell, C. F., 165, 179
Morrison, P. and T., 433
Newman, T. F., 387
Noakes, A. A., 568, 642
Power, P. E. le Poer, 225
Priest, A. E., 434, 509
Roffey, A., 701
Siedle, C. F., 445, 579, 655
Soward, F., 554, 669
Thorne, H. S., 434, 523

Beach photographers fined, 507, 537
Belfast, photography in strike time, 62
Bellows, renovating, 409
Bichromate-mercury intensifier for negatives. By D. Charles, 172
Bioscope, origin of word (Cor.), 107
Bisecting rule for centering mounts and mount cutting. By V. Jobling, 622
Bleach-out process (Cor.), 28
Blinds and curtains for the studio. By Practicus, 530
— festoon, fitting, 657
Blocked-out negatives, substitute for opaque, 711

BOOKS REVIEWED.

Chemical Dictionary, The Condensed, 640
Chemical Reagents, 554
Chemist and Druggist Diary, 16
Design in Picture Making by Photography, 683
Elements of Photography. By F. R. Fraprie, 507
Figures, Facts, and Formulæ, More, 146
Hands in Portraiture, 6
Home and Garden Portraiture, 507
Kelly's Directory of the Chemical Industries, 1919, 553
Marvels of Photography. By C. R. Gibson, 593
Photograms of the Year, 6
Stereoscopic Photography, 553
Theory of Modern Optical Instruments. By Dr. A. Gleichen, 177
Wonders of the Seashore. By F. Martin Duncan, 16

Boot accessory for child portraiture (Rev.), 508
Border tints, printed-in, and masked prints. By E. A. S., 314
British and Colonial Camera Club, formation, 555
British Industries Fair, fifth, 101
British Journal offices in enemy air-raids, 1
— — price raised to threepence, 733
British Photographic Manufacturers' Association, annual meeting, 726
Brodrick photographic apparatus, 219
Broken negatives, repairing, 235
Bromide, paper, amidol v. M.Q. developer, 75
— — de luxe, cream carbon, double-weight, Illingworth (Rev.), 325
— — hard-grade Press, Criterion (Rev.), 728
— — portrait, Criterion (Rev.), 325
— — time development, 257
— — transfer, Kerotype, Ltd. (Pat.), 400
— — — demonstrations, 16, 127, 254
Bromide printing, past and present. By C. B. Barnes, 204
— — By Practicus, 707
— prints, fixation, 198, 226, 239
— — fixing bath to stain on ceasing to fix, 230
— — purple tones by re-development (Cor.), 63
— — — By E. Manley, 128
— — sepia toning, localised, 645
— — toning processes compared, 743
Bromoil portraits, F. T. Usher (Rev.), 194
Bromoils, hand-engraved for copper-plate effects, 630
— negative (Cor.), 714
Bronzed complexions, photographing, 466
Butcher-Williamson cinematograph arrangement, 402
Business methods in the studio. By Practicus, 291
— pitfalls, 230
Businesses, Retail, Licensing Order, administration changes, etc., 149, 225, 706

C

Callitype, photo-mechanical reproduction of typewriting, 690
Cameras and lenses for studio. By Practicus, 11
— and plates, small, new standard sizes, 214, 220, 239, 255, 270, 274
— focal-plane, British Anschutz, Peeling and Van Neck (Rev.), 667
— — roll-film, Thornton-Pickard Mfg. Co., 339
— folding, Newton and Wright, Ltd. (Pat.), 269
— — S. P. Twemlow (Pat.), 355
— hand, for professionals, 698
— — — By Practicus, 368
— movements. By D. Charles, 331, 348, 364
— panoramic, N. Stefani (Pat.), 163
— photogrammetric, N. Stefani (Pat.), 477
— roll-film, G.E.M. Engineering Co. (Pat.), 552
— — S. P. Twemlow (Pat.), 268
— studio, Salex City Sale (Rev.), 640
— vest-pocket, advantages in commercial work, 390
— — specifications for. By E. L. C. Morse, 234
(See also *Vest-pocket.*)
— with mechanical plate changing, Thornton-Pickard Mfg. Co. (Pat.), 536
(See also *Aerial Cameras, Reflex Cameras.*)
Camouflage, detection by photography, 594
Canvas, sensitising (Cor.), 594
— — silver grey tones (Cor.), 643
Carbon printing. By Practicus, 675, 692
— — by artificial light. By S. S. Richardson, 35
— — strip tests, 10
— tissue, non-sensitiveness to fumes, 170
— — sensitising, 242
Carbro (Ozobrome) printing process. By H. F. Farmer, 583
— demonstration at Croydon, 758
— — at R.P.S., 729
Card index system for orders (Cor.), 594
Carvacrol, para-amino-, developer, preparation. By H. A. Lubs, 534
Catford, A., representing Messrs. Houghtons, 537
Cats, photography of, 131
Cecil, Hugh, and excess profits tax, 750, 754
Celluloid, emulsion-coating, N. L. Scott (Pat.), 41
Celluloid—facing of miniatures, 102
Changing bag, home-made (Cor.), 195
— boxes, C. Rothmeyer (Pat.), 236
Changing studios and businesses. By Practicus, 659
Chemical Dictionary, the Condensed (Rev.), 640
Chemical Industries, Kelly's Directory of, 1919, 553
Chemical Reagents (Rev.), 554
Chemicals, dyed, A. de Brayer (Pat.), 177
— economy in, 58
— storage, 411
Children, photographing. By Practicus, 312
— studios' advertising to. By E. A. Dench, 710
China, trade marks in. By W. B. Kennett, 664
Christmas portrait business, timely preparations, 652
Chromium intensification with chlorochromates. By A. and L. Lumière and A. Seyewetz, 451
— — followed by mercury. By D. Charles, 172
— — hydrobromic acid bleach. By R. E. Crowther, 709
Cinematograph camera, making money with. By E. A. Dench, 661
— films, developing and drying. F. B. Thompson (Pat.), 162
— — reinforced, H. Degens (Pat.), 237
— — spools, A. Laban (Pat.), 401
— picture-films for schools, Hudson's Bay Company's project, 597
— — lettered, S. A. Flower (Pat.), 208
— — permanent collections, 402
— — speaking, reported Swedish invention, 638
— night effects. By R. Dykes, 528
— or kinematograph (Cor.), 78, 90, 119, 134, 150
— shutters, H. Shorrocks (Pat.), 209
— — A. G. Smith (Pat.), 283
Cinematography, colour, L. F. Douglass (Pat.), 16
— — J. Shaw (Pat.), 386
Clock, dark-room, constructing, 161
Closing of studios, holiday. See *Holiday closing.*
Club photography, a copyright point, 230
Coal, gas, and electricity, continued rationing, 357

Cohen and Leveton, dissolution of partnership, 238
Coles and Crane, partnership dissolved, 593
Colour, books on, 87
Colour cinematography (Pat.), 16, 386
— — digest of recent processes, 27
— fourteen points on. By A. V. Godbold, 261, 275
— photography and cinematography (Gorski and Rodgers and Finnigan), 537
— — composite mosaic and full-tone process, Hess-Ives Corporation (Pat.), 61
— — copper and iron toning, Hess-Ives Corporation (Pat.), 578
— — mosaic imbibition process, H. Pedersen (Pat.), 61
— — two-colour process, Friese-Greene (Pat.), 728
— — screen-plate, Dufay, 606
— — — J. T. Smith (Pat.), 712
— — sensitive units for J. H. Christensen (Pat.), 693
— — transparent sensitive emulsion for three-colour films, J. H. Christensen (Pat.), 630
Colour-sensitive emulsions, F. F. Renwick and another (Pat.), 609
Colour-sensitiser for two-colour process, Friese-Greene (Pat.), 728
Colour values in monochrome, and a new viewing filter. By F. F. Renwick, 334, 351
Colouring photographs, J. MacDougall (Pat.), 662
Combination printing, 606
— — By Practicus, 587
Commercial photographs, county court claim, 444
— — soft-focus, 481
Commercial photography of difficult metal subjects. By R. B. Lockwood, 217
— — price policy. By O. D. Crain, Junr., 662
Commission system for receptionists. By N. Barrie, 87

COMPANIES REGISTERED—

Adams Studios, Ltd., 266
Aerial Photos, Ltd., 445
Arlington Co., Ltd., 149
Around the Town, Ltd., 419
Black Cat Studios, Ltd., [illegible]
Bournemouth Photo Engraving Co., Ltd., 566
Boyde's Studios, Ltd., 17
Br[illegible] Illustrations, [illegible] 66
Bri[illegible] Metal Printing Co., Ltd., 664
Brodrick, F., Ltd., 295
Carter, R. E., Ltd., 442
Chandler, S. A., and Co., Ltd., 374
Clan, Ltd., 643
Commercial Art Studios, Ltd., 203
Derby Photo Works, Ltd., 634
Developers, Ltd., 731
Doncaster Rotophone Co., Ltd., 134
Dye Impression Photos, Ltd., 703
Everison, Ltd., 509
Entwistle, Thorpe and Co., Ltd., 362
Fotoco, Ltd., 287
F[illegible]ton Process (1919), Ltd., 294
Garnet Pickles Preparations Co., Ltd., [illegible]
General Chemical and Pharmaceutical Co., Ltd., 291
Gurney Advertising Co. (1919), Ltd., 670
Guild of Illustrators, Ltd., 509
Harro, Ltd., 731
Hayes, Robert, Ltd., 17
Home Cinema Camera Co., Ltd., 454
Jerome, Ltd., 287
Johnston Optical Co., Ltd., 634
Kappa Works, Ltd., 402
Kofoh Co., Ltd., 7[illegible]
Lens Manufacturers' Supply Co., Ltd., 402
Levenardon and Co., Ltd., 423
Local Views, Ltd., 106
London Etching Co. (1919), Ltd., 445
Mawson Co., Ltd., 443
Meadows Optical Co., Ltd., 508
Miller, F. W., and Co., Ltd., 374
Nash, Kenyon and Co., Ltd., 298
Navana, Ltd., 367
Oxford Studios (London), Ltd., 24
Peerless Photo Paper Co., Ltd., 627
Perry, P. F., and Co., Ltd., 287
Photographic Service Co., Ltd., 419
Photogravure Co., Ltd., 287
Portraiture, Ltd., 402
Precision Lens Moulding Co., Ltd., 83
Premier Film Printing and Chemical Co., Ltd., 478
Press Services, Ltd., 713
Rajar, Ltd., 713
St. Stephen's Photo-Engraving Co., Ltd., 202
Sanderson, Sater and Co., Ltd., 570
S[illegible] and Projections, Ltd., 670
Scott, N. L., and Co., Ltd., 628
Selby Chemical Co., Ltd., [illegible]
Southgate Bros., Ltd., 744
Sunbeam Photo, Ltd., 670
Tearne and Sons, Ltd., 7
Tuttle, Ltd., [illegible]
United Kingdom Optical Co., Ltd., 374
Universal Woodworking Co., Ltd., 202
Vitty and Seaborne, Ltd., 134
Walter Colley, Ltd., 670
Walton Adams and Son, Ltd., 744
White's, R., Photographic Co., Ltd., 922
Wynne-Harley, Ltd., 202

Contrast, rendering in photographic printing, fundamental law. By A. W. Porter, D.Sc., and R. E. Slade, D.Sc., 471
Convention, Photographic, Oxford meeting, 238, 41[illegible]
Co-operative Plate Works, Ltd., winding up, 43
Copying. By Practicus, 200
— and enlarging, postcard lantern as an aid, 174
— camera fitting for exact scale. By D. Charles, 736
— methods for professional studio, 471
— of sitters unfinished proofs, appeal to trade firms, 719
— testing lenses for, 546
Copyright, creation and ownership, 614
— in club photographs, 230
— in old photographs: effect of the 1911 Act on copyrights created under the 1862 Act, 674
— in surplus negatives, 231
Copyright infringement, Keogh v. Leventhal, 414
Costs in photo-engraving. By A. J. N., 231
Cranfield Press, dissolution of partnership, 713
Crisp, J. R., new appointment, 80
Croft, J. P., bankruptcy discharge applied for, 43
Crookes, the late Sir William (Cor.), 239
Cutting plates for small cameras. By V. Jobling, 564
Cycle portraits, arranging, 153

D

Dampness and faded prints, 574
Dark-room and its fittings. By Practicus, 382
— safe-lights, selecting, 330
— illumination, reflected light, 106
— lamp, Ensign-Duplex, Houghtons (Rev.), 506
— sink, grid for (Cor.), 179
— warming, extemporised oil heater, 613
Dark-rooms, R.A.F., surplus for disposal, 537
Dark-slides out of register. By W. E. Debenham, 51
— re-velvetting, 409
Davis, W. J., and Arbus, L., partnership dissolved, 445
Daylight, artificial, by multicolour reflector, 702

DEATHS.

Brunton, F., 17
Chaffin, J. T., 663
Chalmers, S. D., 702
Charles, Madame Lallie, 210
Corke, H. Essenhigh, 115
Cory, A. S., 210
Crookes, Sir W., 159
Dallmeyer, Mrs. J. H., 567
Hammer, W. H., 234
Hopwood, H. V., 726
Jourdain, Philip E. B. 610
Pickard, G. A., 565
Piper, C. Welborne, 129
Secretan, O. W., 149
Strong, Henry A., 505
Webster, O. Watmough, 100
Welford, Walter D., 434
Wills, H. J. B., 43

Defects, tracing, in negatives, 514
Density of negatives, photometer for comparison. By H. W. G. Bidgood, 637
Desensitisers and development papers. By W. C. Mann, 626
Design in Picture Making by Photography (Rev.), 642
Developer and fixer combined for ferrotype plates (Cor.), 195
— — Hochstetter's patent, 14
Developers, comparison as regards various working properties, 727
Developing and printing for amateurs, prices (Cor.), 444
— formulæ, alternative chemicals. By J. I. Crabtree, 368
— solutions, how to mix. By J. I. Crabtree, 380
— tanks, J. P. Hansen (Pat.), 546
Development, complete, of bromides, test for, 121
— negative, 154, 306
(See also *Tank Development*.)
Diagrams, enlargements of, for use in schools, 573
Diffused prints from sharp negatives, 574
Diffusing media, absorption variations, 607
— screens, in supplementary control of lighting, 580
Dishes, coatings for, 674
Distorted photographs, lens for, W. H. Baker and another (Pat.), 226
Distortion, lens, in copying, avoiding, 45
Dividing light-pencils, prism and grid for, D. F. Comstock and another (Pat.), 492
Double exposures, preventing (Cor.), 610
Drawing, self-training, 500
Dry-mounting tissue, Akron (Rev.), 198
— with a copying press (Cor.), 419
Drying cabinet for negatives (Cor.), 594
— — X.L., Brodrick (Rev.), 223
— prints, machines, S. H. Moese (Pat.), 163, 744
— with spirit: cause of white deposit. By L. P. Clerc, 250, 273
Dufay colour screen-plate, 606
Dyed chemicals, A. de Brayer (Pat.), 177
Dye-toned images, F. E. Ives (Pat.), 6
Dye-toning of lantern slides, 599

E

Eastman Research Laboratory, war work, 715
— yellow, new dye for light-filters, 44
Eder, Dr. J. M., biographer of Schulze, 594
Edinburgh Society of Professional Photographers, meetings, 42, 90, 147, 209, 341, 419, 609, 666
— — annual dinner, 730
— — visits Glasgow, 654
Education of assistants, 62
Efficiency in the workroom. By H. G. Stokes, 575, 594, 608
Electric bulbs, colouring and frosting, 179
Electricity and photography in warfare (portable generating plants). By H. Moss, 113
— power rate for photographers, Edinburgh (Soc.), 662
Elements of Photography (Rev.), 507
Eliot, George, photographic record of scenes in the life and writings of, 619
Embossing board for mounts and prints, 606
Emulsion-coating of celluloid, N. L. Scott (Pat.), 41
Emulsions, sensitive, transparent, J. H. Christensen (Pat.), 630
Enemy patents and trade marks, 401
Engineers, Royal, photography with, in war-time, 102
Enlarged negatives, methods of making, comparative notes, 467, 498
Enlargements, canvasser sentenced, 579
— for finishing, 9
— negatives filling standard-size papers, 251
— of diagrams for teaching purposes, 573
— vignetted and diffused, fitting for lantern stage. By A. Henderson, 720
Enlarging and copying, postcard lantern as an aid, 174
— and grain, 242
— and printing room, arranging, 575
— and reducing in true-to-scale processes. By D. Charles, 736
— advantage of interchangeable condensers, 557
— apparatus, P. Boucard (Pat.), 461
— daylight, estimating exposure, 300
— easels, H. W. Moyne (Pat.), 324
— — holder for bromide paper (Cor.), 446
— lantern, projection lenses of various focal lengths. By A. Henderson, 720
— — Salex, City Sale (Rev.), 653
— methods and novelties. By F. B. Howe, 546
— soft effects. By J. W. Doubleday, 158
Envelopes for films and plates, J. P. Hansen (Pat.), 623
Etching effects in enlargements, 547
Etching time, standardising in photo-engraving, 370
Evidence, legal, photographs as. By La Verne T. Ryder, 276
Examinations, City and Guilds of London, change of programme, 637
— — questions in pure photography, 336
— — questions in, photo-mechanical processes, 353
Excess profits tax, judgment against Hugh Cecil, 750, 754

EXHIBITIONS—

See also *Royal Photographic Society* and *Salon, London*.
Bemington, W., photographs by, 5
British Scientific Products, 399
Canadian Official War photographs, 16
Carbon and Ozobrome prints at the Camera Club, 207
Coloured prints by Mr. and Mrs. W. Giles, 75
Hampshire House Photographic Society, 222
Lancashire Master Photographers' Association, 323
Lubochez, N. E., photographs by, 370
Muir, Ward, straight photographs by, 536
Rotherham Photographic Society, 660
Royal Air Force, photographs by, 207
Spitsbergen, photographs by Mr. R. N. Spealght, 712
Swan, Dr. A., photographs by, 161
Export trade, red-tape of the War Trade Department, 130
Exports, photographic, free, 144
Exposures in the studio. By Practicus, 49
Expression in portraiture. By W. E. Debenham, 109
Eyes in portraiture, expression, 714

F

Factory dangers, warning by photographs, 635
Faded prints and dampness, 574
Ferrotype button plates, manufactured in England (Cor.), 255
— plates, combined developer and fixer (Cor.), 195
— — — Hochstetter, 14
Fifty thousand photographs per sec.! (Abrahams and Bloch), 730
Figures, Facts and Formulæ, More (Rev.), 146
Film, roll, detachable sections on paper band, I. M. Kelley (Pat.), 700
— — development machine, E. J. Sweetland (Pat.), 493
— — spools, cultivating amateur trade (Cor.), 570
— — — for various cameras, H. Nimmo (Pat.), 209
— — — waterproof, A. W. McCurdy (Pat.), 356, 478
Filtering solutions. By J. I. Crabtree, 379
Finders, focussing, O. S. Lalin (Pat.), 417
Finishing bromide prints (Soc.), 146
— plant (development and printing of film exposures). By G. W. Greene, 740
Fixing and washing negatives, general principles, 630
— and washing of prints. By G. F. Stine, 205
— bath, acid, preparing. By J. I. Crabtree, 393, 395
— bromide prints, 198, 226, 230, 239
— in thirty seconds (K. Hickman), 705, 711
— solutions, how to mix. By J. I. Crabtree, 393
— — recovering silver with metal plate, 685
Flame, photographic tests, 210
Flash lamp, J. P. Hansen (Pat.), 371
Flashlight accident, 342
— curing the smoke trouble (Anal.), 132
— powder, Professional, Johnson (Rev.), 325
— powders, smokeless and odourless, Wedekind's patent, 14
— volatilized metal, J. and P. Courtier (Pat.), 553
— work. By Practicus, 601, 617
Flattening postcards or prints (Cor.), 435, 463
— — home-made press, 603
Flower photography for commercial work, 91
Focal length, measuring, J. Trotter (Pat.), 116
— — by image of sun (Cor.), 702
— — of hand camera lenses (Anal.), 682
Focal-plane shutter, efficiency of, 123, 167
— — for stereoscopic aerial photography (Pat.), 535

Focal-plane shutter, tests of action. By M. Equer and E. Cousin, 280
— — Thornton-Pickard Mfg. Co. (Pat.), 552
Focussing magnifiers (Cor.), 538, 555, 569
— screen, expedients for replacing, 459, 479
— screen for photo-micrography. By G. Ardaseer, 363
Fog, chemical, causes. By J. I. Crabtree, 97
Fog in the studio, counteracting, 122
Folders, cut-out mount pattern, 673
Formaline, rotting action on negatives (Cor.), 747
Frames, renovating with gold-size, 193
— stains for, formulæ (Soc.), 758
Free sittings, an outside view, 143
Fry, S. H., appointed paid secretary to P.P.A., 641
Furniture and accessories in the studio, 88
Furse, W. A., dealer in photographic apparatus, 478

G

Garden portraiture. By C. H. Davis, 487
Gaslight enlarging, half-watt and mirror, 319
— papers, merits of. By J. Hall, 219
Gelatine, British, use in war-time (Cor.), 54
— physical properties of, 607
— recent research, 27
General Art and Photographic Agency, partnership dissolved, 642
Geological Association, British, photographs committee, 342
German and British lenses (Cor.), 78, 210
German cameras, illegal importation by officers, 153, 182, 199, 274
Glass, optical, origin of striæ, 149
Glazing troubles and remedies. By C. B. Barnes, 316
Graves, war, public photographs discontinued, 579
— — number of photographs made, 685
Guide negatives and prints, 491
Gum-bichromate process with new colloid, H. G. Starnes (Soc.), 50
— effects in enlargements, 547
— multiple method. By C. Macnamara, 320

H

Halation and development (Cor.), 7
— recent research, 27
Half-tone blocks, ordering best originals, etc., 526
— — coarse-screen, getting details in, 622
— — light edge against dark, 492
— — moiré pattern, avoiding, 552
— — mounting, to point ems (Cor.), 686, 715, 759
— — rapid making by *Daily Mail*, 509
— — relief lettering, 322
— — screenness, 322
— — *Sketch* first to use exclusively (1893), 727
— — vignetted, faulty etching, 622
— screens, ceramic, E. W. Smith (Pat.), 416
Half-watt for gaslight enlarging, 319
Hall, H., and Siggers, F., partnership dissolved, 285
Hana, G., recovery from illness, 286
Hand-camera pioneer, George Hare, 1
Hand-cameras for the professional, 368, 698
Handford, A., director of Gordon Chase, Ltd., 302
Handle, flush, for cameras and carrying cases. By V. Jobling, 697
Hands in Portraiture (Rev.), 6
Hardener, Tropical, Ilford, Johnson (Rev.), 325
Hardening bath for tropics, A. J. Agnew and others (Pat.), 460
Hare, G., hand-camera pioneer, 1
Head in portraiture, posing. By Practicus, 423
Heating and ventilating the studio, 111
Heawood and Watson, partnership dissolved, 669
Hectograph copying, ink formula, 554, 570
— jelly for duplicating (Soc.), 554
Heron, M., and Wechsler, A., partnership dissolved, 105
High-temperature development, A. J. Agnew and others (Pat.), 460
Holiday closing of studios (Cor.), 358, 446, 462, 479
Home and Garden Portraiture (Rev.), 507
Home portraiture. By C. H. Davis, 453
— — (Foster Brigham), 71
— — By Practicus, 172
Horseback portraits in Hyde Park, tenders invited, 621
Hudson's Bay Company, financial supporters of school cinema films, 597
Hydrometer test of solutions, 366
Hydroquinone-Rodinal developer, 79, 90
Hygiene in the dark-room, 139
Hypo solution, making without weighing (Soc.), 117
Hypo-alum toning bath, metal dishes (Cor.), 447, 462
— v. sulphide toning (Cor.), 579

I

Identification outfit, F. and S., Kodak (Rev.), 76
Ilford, Ltd., dividend, 713
Import regulations, photographic goods, 274, 450, 469, 498
— — declared illegal, Sankey judgment, 749
— — in Anti-Dumping Bill, 690
Importation of paper without licence, 622
Intensification and reduction of negatives (Soc.), 166
— chromium, with chlorochromates. By A. and L. Lumière and A. Seyewetz, 451, 709
Intensification, chromium, modified formula, 87
— — mercury. By D. Charles, 172
— portrait negatives. By Practicus, 439
— with pyro developer. By R. S. Wilsey, 721
Intensifiers, organic, 181
Iodine-cyanide reducer, compounding, 57

K

Kallitype prints, permanence of, 685
Kathol-hydroquinone developer, 741
Kentmere, Ltd., new London agent, 302
Keogh v. Leventhal, copyright infringement judgment, 414
Kerotype transfer bromide and gaslight papers, 16, 127, 254, 400
Kitchener, Lord, historic photographs by, 626
Kodak (Australasia), Ltd., increasing profits, 250
Kodak, Eastman, Company, annual report, 443
— — dividends, 92, 270, 410, 509, 602, 684
— — share-holding scheme for employees, 220
— — war memorials unveiled, 702
(See also *Eastman*.)
Krupps, report of camera-making, 639

L

Labour shortage and its effects in American photo-engraving, 476
Labelling bottles, 552
Lancashire and District Master Photographers' Society, annual dinner, 62, 118
— — exhibition (Soc.), 343
— — meetings, 373, 433, 668
— — officers, 342
Lan-Davis, C. F., will of the late, 91
Lantern, projection, with extra short-focus objective. By A. Henderson, 720
— screens, J. Chanteux (Pat.), 145
— — H. R. Gilpin (Pat.), 477
— — R. Harris (Pat.), 536
— — F. Heale and another (Pat.), 177
— — C. F. Kirby (Pat.), 41, 177
— postcard, in copying and enlarging. By A. Lockett, 174
Lantern-slides, announcement, R. G. Elder (Pat.), 208
— dye-toning, review of recent processes, 598
— of cine. film-pictures, F. W. Perkins (Pat.), 208
— making, personal practice in, Dudley Johnston, 25
Large proofs as business getters, 75
Latent image, recent research, 27
Laws, Major F. C. V., permanent commission, 462
Leaky studio roofs. By Practicus, 515
Legal photography. By La Verne T. Ryder, 276
Lens, air-space anastigmat, A. A. Smith (Pat.), 680
— apertures, measuring, 450
— cells, stuck, tool for removing, 608
— distortion from, in copying, avoiding, 45
— for distorted photographs, W. H. Baker and another (Pat.), 236
— triplet large aperture, A. Taylor and others (Pat.), 430
Lenses, British, opinions and criticisms (Cor.), 569, 579
— — and German, need of propaganda, 2
— — for aircraft photography, development. By W. B. Appleton, J. Hasselkus, and Aldis Bros., 243, 264
— buying, considerations in, 221
— cleaning, chamois bag for, 711
— flare, avoiding, 45
— for portraiture. By Practicus, 232, 349
— quartz of f/4 aperture, 717
— second-hand, caution to buyers (Cor.), 627
— — colour, 121
— special, for odd jobs, 94
— testing for process and copying work. By E. K. Hunter, 565
(See also *Soft-focus Lenses, Telephoto Lenses*.)
Licenses for retail businesses. (See *Retail Businesses (Licensing) Order*.)
Light-filters from new yellow dye, 48
— making (Soc.), 477
Light-filters, Wratten M., 18
Lighting and tone in portrait photography, 424
— in portraiture. By Practicus, 3
Likeness in portraits, some critics on, 558
Lithographic transfers from bromide prints. By J. Graham, 188
Liver of sulphur for toning bromides, 169
Liverpool, photographers' club (Cor.), 509, 642
Living-portrait photographs, R. I. Atherton and others (Pat.), 236
London, photographic survey in 1919 by Camera Club, 109, 114
Loveday, A. F., resumes professional work, 249 583

M

Machine gun camera. C. D. M. Campbell and another (Pat.), 253
Major, C. H., C. L., and C. R., partnership dissolved, 462
Mapping from air photographs. By M. N. MacLeod, D.S.O., 503, 518
Margins, white, preparing stock masks, 513
Marshall, H. E., and Higson, C., partnership, 568
Marshall, W., disposal of business, 446
Materials and processes, photographic, 1917 and 1918. By B. V. Storr, M.Sc., 13, 27, 605
Matt-surface originals, reproducing, 355
Mechanical subjects, difficult, photographing. By R. B. Lockwood, 217
Memorial photographs, public expenditure, 140
Mercury-vapour light, improving visible effect (Cor.), 78, 90
Metol-Griffins (Rev.), 554
Metric formulæ, easy conversion, 5
Micrographic, photo-, cameras, vertical, C. Baker (Rev.), 663
Micrography, photo-, new Wratten M-filter for, 18
Microscope, dispensing with, in photo-micrography. By G. Ardaseer, 483
— joint conference on, 755
Miniatures. By Practicus, 550
Minimum wage for assistants, advantage of, 29
Mirage, photographing, 374
Mirrors, protective coatings for, 614
Model Homes Exhibition, water-heating appliances, labour-saving, 286
Monomet-hydroquinone developer, time development, 250
— — formulæ (Cor.), 271
Motion-picture. (See *Cinematograph*.)
Mounts and mounting. By Practicus, 278
— bisecting rule for centering on. By V. Jobling, 622
— chart for stock-keeping, 589
— reasonable prices, county court judgment, 669
Multiple vignettes with print-out papers. By E. A. S., 468
— — film negatives for, 576

N

NAMES AND MARKS, TRADE.
(*Applied for, registered, renewed, or removed.*)

Aristo, 592
Autokon, 700
Biogravure, 146
Bromires, 372
Celverex, 700
Challenge, 477
Circoid, 461
Crystalite, 624
Dallmeyer, J. H. (London), 146
Duogen, 537, 682
Eagle (Design), 700
Eideler, 372
E. P. G. (Design), 477, 652
Goldona, 700
Grindelimatograph, 461
Idento, 372
Imperial (Lion label device), 700
Kineparts, 431
Kodak, 146
Lactoid, 624
Living Picture Camera (Design), 372
L. L. (Design), 146
Luxuria, 639
Mattos, 237, 372
Meritol, 283, 537
Metagol, 88
Monophen, 145
Niltona, 639
Nobrah, 237
Osda, 477, 652
Paramin, 146
Permalvne, 567
Poco, 372
Sinnox, 146
Stipplette, 700
Tonix, 146
Train and Camera (Design), 237
V. B. D. Plex (Design), 145
Vigura, 728
Vodette, 177
W. B. Design, 88, 208
Wip, 372

Names and trade marks in China. By W. B. Kennett, 664
National Physical Laboratory, new director, 523
Naval photographs wanted, 374
Navy Service photographers, conditions and pay, 685
Negative making, various factors in, 619
— paper, recent patents, 13
Night photography. By R. Dykes, 484, 501, 516, 528
Nude, photographs at the Royal Photographic Society's exhibition (Cor.), 685

O

OBITUARY (*See* **DEATHS**).
Off-set ink image as a negative, J. A. Hatt's patent, 492
Oil portraits, fraudulent canvasser, 118
Oil printing, spirit sensitisers in (Anal.), 461
— transfer process (Anal.), 165
Old people, photographing. By Practicus, 333
Optical glass, British manufacture, brief review, 189
Optical Instruments, Modern, Theory of (Rev.), 177
Orthochromatic photography, Ilford vision filters, 224, 474
Outdoor portraiture. By C. H. Davis, 487
Outfit, beginner's, for studio and outdoor photography. By Practicus, 633
Ox-gall, preserving (Cor.), 510
Ozobrome materials, Autotype Co. (Rev.), 325
— process, working instructions. By W. H. Moffitt, 531
— — Carbro modification. By H. F. Farmer, 578, 583, 729

P

Panchromatic photography, Ilford booklet, 478
— plates, filters for. By J. McIntosh, 317
Panoramic cameras, N. Stefani (Pat.), 163
— photographs and perspective. By C. J. Stokes, 67
Paper base, raw, photographic, Wiggins, Teape Company formed, 160
Papers, development, and desensitisers. By W. C Mann, 426

Para-amino-carvacrol developer, preparation. By H. A. Lubs, 534
Partnerships, personal and business factors, 214
Passe-partout frames, Weslem, Witt and Westley (Rev.), 146
Patent Office Library, new photographic department, 1
Patentees, intending, notes for, 542

PATENTS, AUTHORS OF—

Agnew, A. J., and others—high-temperature development, 460
Ashford, J.—tripod stands, 476
Atherton, R. I., and others—living portrait photographs, 236
Baker, W. H., and another—lens for distorted photographs, 236
Baylis, A. S., and another—plan-copying machine, 5
Bloch, O., and another—colour sensitive emulsions, 699
Boucard, P., and another—enlarging apparatus, 461
Brayer, A. de—dyed chemicals, 177
Brock, Junr., A.—aerial cameras, 506, 507
Bryant, G. W., and another—lantern screens, 177
Burnett, E. E.—X-ray paper, 417
Campbell, C. D. M., and another—machine-gun camera, 253
Campion, G. G.—X-ray directors, 162
Chauteux, J.—metallic lantern screens, 145
Christensen, J. H.—sensitive units for colour photography, 662
— — transparent sensitive emulsion, 689
Comstock, D. F., and another—prism and grid for dividing light-pencils, 492
Courtier, J. and P.—flashlight, 553
Croneen, S.—living portrait photographs, 236
Crosland, G. W. K., and T. P. K.—X-ray paper, 209
Dawkins, B. W., and another—plan-copying machine, 5
Douglass, L. F.—colour cinematography, 16
Degeme, H.—cinematograph film, 237
Dorel, F.—true-to-scale process, 536
Duerr, E.—aerial photography, 237
Edwards, G.—self-portraiture shutter releases, 691
[illegible]r, E. G.—lantern-slides, 209
[illegible]ish, D. A.—aerial stereoscopic photography, 686
Flower, S. A.—cinema films, 298
Franklin, W. H.—electric retouching pencils, 364
Friedmann, D.—automatic shutter releases, 699
G. E. M. Engineering Co.—aerial cameras, 477
— — roll-film cameras, 562
Gilpin, R.—lantern screens, 177
Greer, W. J., and another—shock absorbers for cameras, 176
Hansen, J. P.—developing tanks, 567
— — envelopes for films and plates, 623
— — flash lamp, 572
Harris, E.—lantern screens, 536
Heale, F., and another—lantern screens, 177
Hess Ives Corporation—colour photography, 61
— — and another—colour photography, 576
Ilford, Ltd., and others—high-temperature development, 460
Ives, F. E.—colour photography, 61
— — dye-toned images, 6
— — and another—colour photography, 578
Kelley, J. M.—roll-film, 700
Jones, D. B., and others—living portrait photographs, 236
Kerotype, Ltd., and another—transfer bromide paper, 401
Kirby, C. F.—lantern screens, 41, 177
Laban, A.—cinematograph film spools, 401
Lalla, G. S.—focussing finders, 417
Laws, F. C. V.—aircraft cameras, 299
Lee, H. H., and others—telephoto lenses, 591
Lemaire, L., and another—enlarging apparatus, 461
Litchfield, T., and others—folding cameras, 269
MacDougall, J.—colouring photographs, 422
Martin, L. A. W., and another—shock absorbers for cameras, 176
McCurdy, A. W.—roll film, 176
— — waterproofing film spools and packs, 386
Merrett, J., and another—print trimmers, 252
Middleton, T. P., and another—transfer bromide paper, 401
Millward, W., and another—lens for distorted photographs, 236
Morse, A. H.—print-drying machines, 168, 744
Moyne, H. W.—enlarging and printing easels, 224
Newton and Wright, Ltd., and another—folding cameras, 269
Nimmo, H.—film spools, 298
Oldfield, B. and J. and R.—rotating print washers, [illegible]
Pedersen, H.—colour photography, 61
Perkins, F. W.—lantern slides, 209
Pickard, A. G., and others—cameras with mechanical plate-changing, 536
— — — focal-plane roll-film cameras, 239
— — — focal-plane shutters, 653
Renwick, F. F., and another—colour-sensitive emulsions, 699
— and others—high-temperature development, 460
Rothmeyer, C.—changing boxes, 236
Scott, N. L.—emulsion-coating of celluloid, 41
Shaw, J.—colour cinematography, 386
Shorrocks, H.—cinematograph shutters, 299
Slinger, F., and others—cameras with mechanical plate-changing, 536
— — — focal-plane roll-film cameras, 239
— — — focal-plane shutters, 653

PATENTS, AUTHORS OF (Continued).
Smith, A. A.—air-space anastigmat lenses, 650
Smith, A. G.—cinematograph shutters, 283
Smith, E. W.—ceramic half-tone screens, 416
Smith, J. T.—colour screen-plates, 712
Stefani, N.—panoramic cameras, 163
— — photogrammetric cameras, 477
Sweetland, E. J.—roll-film developing machine, 493
Taylor, A. and H. D., and others—triplet large-aperture lenses, 431
Taylor, Taylor and Hobson, and another—telephoto lenses, 591
Technicolor Motion Picture Corporation, and another—prism and grid for dividing light-pencils, 492
Thomas, A., and another—print trimmers, 252
Thompson, F. B.—developing and drying cinematograph films, 162
Thornton-Pickard Manufacturing Co., and others—cameras with mechanical plate-changing, 536
— — — focal-plane roll-film cameras, 239
— — — focal-plane shutters, 653
Trotter, J.—measuring focal length, 116
Twemlow, S. P.—folding cameras, 365
— — roll-film cameras, 263
Waddell, P. H.—print washers, 103
Williams, F. D.—submarine effects, 700
Williamson, C. M., and another—aerial cameras, 323, 324
— — — machine-gun camera, 253
Williamson Kinematograph Co., and another—aerial cameras, 323, 324
Workman, H.—aeroplane cameras, 131
Patents and trade marks, enemy, 401
— limited security, 82
Percentage solutions, 366
Permanence of various printing processes for record and survey work, 170
Personal factor in the studio. By Practicus, 470
Perspective and panoramic photography, 67
Persulphate reducer, regularity in working, 600, 612
Photo-engraving, increasing production and reducing selling price. By A. J. N., 457
Photogrammetric cameras. N. Stefani (Pat.), 477
Photograms of the Year (Rev.), 6
Photo-litho negatives. By W. J. Smith, 39
Photo-lithography, retouching half-tones, 416
Photo-micrography, focussing screen. By G. Ardaser, 363
Pictorial photography, progress of. By C. H. White, 72
Pinhole photography, formula. By E. L. Harrison, 753
Piper, C. Welborne, the late, bequest to Croydon Camera Club, 342
Plan-copying machines, A. S. Baylis and another (Pat.), 5
Plate-changing case, portable, home-made (Cor.), 196
Plate-marker, celluloid, Ideal, Sichel and Samuelson (Rev.), 326
Plates and their work. By Practicus, 361
— British in Switzerland, [illegible]
— cutting for small cameras, 564
— reduction of price, 137, 160
— small, new standard sizes, 216, 220, 239, 256, 270, 274, 375
— tests, a suggestion to the R.P.S. (Cor.), 447
Ply wood for mounting enlargements, 102
Poisoning, developer (Cor.), 76, 107, 119
Polish for woodwork, formula, 409
P.O.P. prints, reducing, 366
— red tones on, 2
— toning by number of prints, table, 263
— — systematic (Cor.), 308
— — without gold, 380
Portable studios. By Practicus, 386
Portrait business, prospects of, 274
Posing the figure in studio portraiture. By Practicus, 734
Postcard studio. By Practicus, 125
Postcards as a studio side line (Cor.), 570, 611
— picture, licensing department, 270
Press photographer, competitor with the portrait photographer, 230, 256, 542, 610
— — minimum rates of pay, 789
— photographs, reproduction fees (Cor.), 254, 270
Press-photographic jottings, 475
Prices of photographic materials, prospects of reduction (Cor.), 62
— selling, of portrait photographs, 490
Print-out papers, multiple vignettes, 463
Printing machine, Ensign, Houghtons (Rev.), 164
— — for amateurs' film negatives, 741
— — holder for vignetters, 711
— — system of lighting for, 576
(See also *Strip-printing frames.*)
— portrait negatives. By Practicus, 550
— processes for portraiture. By Practicus, 70
— room, fitting up. By Practicus, 140
Prisms and grid for dividing light-pencils. D. F. Comstock and another (Pat.), 492
Process work, system of costing. By A. J. N., 231
(See also *Half-tone blocks.*)
Professional Photographers' Association and federation (Cor.), 479
— — council meetings, 6, 52, 104, 179, 224, 234, 432, 624, 372, 641, 700, 737
— — dinner, 617
— — president, 1919-20, portrait, 175
— — report of council, 100
— — secretaryship, S. H. Fry elected, 211, 214, 641, 745
Professional photography, liability to excess profits duty, 750, 754

Profile portraits, 305
Profiteering Act and photographic goods (Cor.), 671
Proofs, copying for sitters by trade firms, 719
— unreturned, and photographer's liability as to the negatives, 646, 671
Pyro developer as intensifier and reducer. By R. S. Wilsey, 721

Q

Quartz *f*/4 lenses, 717

R

Raids, air, on London photographers' premises, 143
Rajar, Ltd., war savings collection, 369
Reagents, Chemical (Rev.), 554
Reception room, arrangement and furnishing. By Practicus, 156
Receptionists and business methods, 670
— commission system for. By N. Barrie, 37
Reconstruction and photography, 110
Record and survey work, photographic, permanence of prints, 170
Reducer, Belitski, for negatives and bromides (Cor.), 689
— Farmer's, for negatives and prints, 500
— iodine-cyanide, for negatives and prints, 500
— persulphate, for negatives and prints, 500
Reducing backgrounds on negatives, 711
Reduction and intensification of negatives (Soc.), 166
— of negatives and prints. By Practicus, 490
— selective, with bichromate (Cor.), 571
— with pyro developer. By R. S. Wilsey, 721
Reflex camera at eye-level (Cor.), 538
— — magazine patterns, 670
Rembrandt portraits, anti-veil screen, 734
Repairs, apparatus, and renovations. By Practicus, 408
— outfit, photographer's, 15
Reproduced negatives, making. By Practicus, 739
Reproduction fees for press photographers (Cor.), 254, 270
Research Association, British Photographic, annual report, 456
— — programme, 190
Research Records Bureau, proposed establishment, 497
Research, Scientific and Industrial Department's report, 529
Residues, recovering from fixing baths with metal plate, 665
Re-sittings, 34
Retail Businesses Order, administration, 149, 225, 242
— — photography exempt, 357
— — application to photographic studios, 449
— — discontinuance, 725
Retouched originals in half-tone work, 366
Retoucher, training. By G. F. Burrell, 174
Retoucher's wages claim, 149
Retouching, avoiding eye-strain (Cor.), 533, 555, 569
— class, formation in Edinburgh, 209
— desk, convenient and comfortable, 505
— — elements of. By Practicus, 751
— — home-made, 559
— medium, formula, 476
— pencils, electric, W. H. Franklin (Pat.), 356
Reversal of image, review of processes, 201
— in tank development (Cor.), 270, 287, 302, 327
— in dish development (Cor.), 626
— of film negatives, 494, 611
Romney's Studios, dissolution of partnership, 654
Roofs, leaky studio. By Practicus, 515
Rotary photogravure, progress in, 416
— — from flat plates, 252
Royal Air Force, photographic section, statistics of work done, 238
— — officers' dinner, 478
— — a question of economy, 462, 524
— — peace footing, 509, 510
— — surplus dark-rooms for disposal, 537
Royal Engineers, photographic work in wartime (Cor.), 134
Royal Photographic Society, annual meeting, 77
— exhibition. By F. C. Tilney, 616
— — portraits, 599
— — scientific, technical and colour, 631
— — photographs of the nude (Cor.), 685
— — committees, 465
— new fellows, 17, 62
— officers (1919), 77
— proposed increase of subscription, 708
— meetings—
Aerial photography, Major F. C. V. Laws, 340
Carbon printing, Dr. C. Atkin Swan, 253
Carbro (Ozobrome) process, H. F. Farmer, 729
Cathedrals of Ely, Lichfield, Gloucester, and Wales, W. J. Roffey, 237
Colour values in monochrome and a viewing filter as an aid to obtaining them, F. F. Renwick, 224
Commercial photo-copying processes, S. Bakerself, 175
Development papers and desensitisers, 269
Discussion on the formation of a scientific group, 103
English fonts from Saxon times to the sixteenth century, S. Gardner, 61
Egypt: its antiquities and people, R. H. Goodsall, 165
Fancy lighting in portraiture, N. E. Luboshez, 745

Finishing bromide prints, N. F. Horne, 146
Hints and suggestions for use in the dark-room, V. Jobling, 117
Home of the Rajput, 284
Hurter and Driffield's work, J. W. Gordon, K.C., 30
Kerotype paper, F. W. Kent and T. P. Middleton, 16
King's Highway, A. H. Blake, 641
Lenses for aerial photography, W. B. Appleton, J. Hasselkus and Aldis Bros., 133
NO and other things Japanese, C. P. Crowther, 701
Photographic evidence for the formation of stars from nebulæ (Traill Taylor lecture), Rev. A. L. Cortie, 625
Presidential address, 52, 668
Printing on paper in natural colours, S. H. Williams, 88
Raydex three-colour printing, F. R. Newens, 653
Spiders, their structure and habits, Dr. G. H. Rodman, 301
West of England Notes, G. Aveneli, 104
— scientific and technical group, 651, 755
Rubber stamps for mounts and stationery, 22

S

Salon, London, of Photography, announcement, 214
— portraits and figure work, 544
— By F. C. Tilney, 560
— marking the prints, complaint (Cor.), 358
Schulze, the discoverer of photography? 598
Second-hand apparatus, buying, 362
— lenses, caution to buyers (Cor.), 627
Self-toning paper, over-printed, remedying, 21
— — securing good tone, 474
Separators, plate, home-made, for dish development (Soc.), 117
Sepias by sulphide toning, failures and causes. By Thermit, 563 (See also *Sulphide Toning.*)
Sheffield and district Professional Photographers' Association meeting, 469
Shew, J. F., and Co., proprietorship, 730, 748
Shock-absorbers for cameras. W. J. Greer (Pat.), 476
Shops Act, photographer's contravention, 117
Shutters, studio, improvements suggested, 423
— releases for self-portraiture, G. Edwards (Pat.), 681
— — D. Friedmann (Pat.), 599
(See also *Focal-plane Shutters.*)
Side-lines for professional photographers. By E. M. Spiers, 158
Sight, photographers' preserving, 115
Silvering mirrors. By J. Graham, 155
— — By W. W. Wall, 370
— — Lundin method, 134
Silverline sketch portraits, D. Charles (Rev.), 194
Sink, dark-room, grid for (Cor.), 179
Sitter, managing the. By Practicus, 23
Sizes, plate, small, new standards, 214, 220, 239, 255, 270, 375
Sketch Photo Co., voluntary liquidation, 713
Sketch portraits, defects in, 182
— — importance of whole pose, 10
Soda v. potash (Cor.), 19, 31
Soft-focus commercial photographs, 481
— — lens, Cooke *f*/6.5 (Cor.), 510
Solutions, photographic, preparing. By J. I. Crabtree, 365, 379, 393, 410
Somerset Postal Photographic Society, presentation to secretary, 626
South Africa and assistants (Cor.), 343
Speaight garden party, 403
Specialisation and efficiency, 144
Specimens, bought, ethics and policy, 438, 542
Spectrum lines, photographic measurement of intensity, 533
Spotting prints. By S. H. Avery, 694
Spots on negatives, causes and prevention, 583
Squeegee board, non-slip, 586
Stains for frames, formulæ (Soc.), 758
Stains on negatives, removing, 65
Stencils for photo-engraving, 476
Stereo-photography in science and industry, 22
Stereoscope, a simple form (Cor.), 446
Stereoscopic photography, aerial, D. A. English (Pat.), 535
— — causes of disfavour, 290
Stereoscopic photography, giant vision, 878
— — portraiture, 346
— — practical methods, 307
— — scientific applications, 407
— — separation for large negatives (Cor.), 358
— — separation when photographing small objects at close range. By Charles E. Benham, 725, 745, 758
Stereoscopic Society, new American branch, 670
Storing negatives. By Practicus, 489
— sensitive papers, 590
Strip printing, uniform depth in, 15
— — frame, G. S. Moore (Rev.), 608
Stripping solutions for wet-collodion, 492
Studio accessories and furniture. By Practicus, 83
— blinds and curtains. By Practicus, 530
— camera and lens, choosing, 11
— — camera, handling. By Practicus, 215
— decoration, effect of aspect, 345
— equipment, buying, 10
— glazing, advantages of rolled glass, 182
— — handling. By Practicus, 215
— portable. By Practicus, 186
— postcard arrangement and apparatus, 125
— surroundings and aspect. By Practicus, 95
Submarine photographic effects, F. D. Williams (Pat.), 700
— photography, salvage of Laurentic, 579
Sulphide toning, failures and causes, 563
— — preliminary sulphide bath, 338
— — re-toning solution, Tonitol (Rev.), 728
— — with barium sulphide, a warning (Cor.), 655
— — with polysulphide, 551
— — v. hypo-alum toning (Cor.), 579
(See also *Hypo-alum Toning, Liver of Sulphur.*)
Summer-time, end of, 568
Surplus negative, copyright in, 230
Survey, photographic, of London in 1919, 109, 114
Switzerland, need of British photographic goods. By E. J. Glumart, 283
— success of British plates. By E. G. Glumart, 756

T

Tank development for time saving, 679, 702, 716
— — reversal (Cor.), 270, 287, 302, 327
Tanks, developing, J. P. Hensen (Pat.), 565
— — for film spools, vitrified clay, 741
Telephoto lenses for professional work. By Practicus, 647.
— H. Lee and others (Pat.), 591.
Tests for plates, a suggestion to the R.P.S. (Cor.), 447
Textile industry, photographs to replace samples, 635
Thermostat for development experiments, 27
Thornton-Pickard cameras for aerial photography. By S. L. Hughes, 293
Tile work, photographing, 576, 620
Times photogravure supplement to weekly edition, 446
Tints, laying, in process work, 491
Tipp, A. W., resumes civilian duties, 249
Titles in view negatives, 258, 735
— — stripping plates for (Cor.), 627.
— transferring, 574
Tone and lighting in portrait photography, 424
— values in portraiture, 266
Tonitol re-toning solution for sepia prints (Rev.), 728
Town-planning and aero-photography (Cor.), 18
Trade marks in China. By W. B. Kennett, 664
TRADE NAMES AND MARKS (*See* **NAMES AND MARKS, TRADE**),
Traill Taylor lecture, twenty-second. By Rev. A. L. Cortie, 625
Transfer bromide paper, Kerotype demonstration, 16, 127, 254
— — (Pat.), 401
Trimmers, print, J. Merrett and another (Pat.), 252
— for large prints, 588
Tripod stands, J. Ashford (Pat.), 476.
True-to-nature photographs. By H. Collingridge, B.Sc., 249
True-to-scale process, formula, 580
— — F. Dorel (Pat.), 536
Type-setting, replaced by typewriting and photo-mechanical reproduction, 691

V

Varnish, cheap, for negatives and prints (Cor.), 670
Ventilating and heating the studio, 111
Vertical photography of small articles, 338
Vest-pocket camera, advantages in commercial work, 300
— — for indoor groups, 466
— — specifications for. By E. L. C. Morse, 234
— Kodak carrying case, Tiranty (Rev.), 683
— — plate-adapter, Tiranty (Rev.), 683
— negatives, development for enlarging, 154
— plates, cutting from larger. By V. Jobling, 564
View postcards, local. By C. Brangwin Barnes, 395
Vignettes, multiple, with print-out papers. By E. A. S., 468
Vignetting for daylight printing papers. By E. A. S., 648
Vision filters for orthochromatic photography, Ilford, 474

W

Ward, Snowden, memorial fund (Cor.), 79
Warming the dark-room, extemporized oil heater, 613
Washer, print, Dependence rotating, Oldfield (Rev.), 326
— — — — (Pat.), 652
— — home-made rotary, 742
— — P. H. Waddell (Pat.), 103
Washing and fixing negatives, general principles, 630
— and fixing of prints. By G. F. Stine, 205
— prints fitting for sink (Cor.), 78
Water, purifying for solutions, 410
Waterproofing wood, anti-sulphuric paint, 552
Ways, the two, of portrait photography, 274
Wedding groups. By Practicus, 577
Weights and measures, metric, in preparing photographic solutions, 365
Wet collodion developer, substitute for acetic acid (Cor.), 226
— — negatives, saving, 252
— — stripping solutions, 492
— — use in photo-engraving, 370
White, Clarence H., interview with, on progress of pictorial photography, 72
Wiggins, Teape Company, manufacturers of photographic raw paper base, 160
Window-dressing, live animals, 718
Winter, outdoor work, 658
Wireless telegraphy, photographic receiver, 287
Women and photography, 206
Wood, imitation of, on metal, 385
— photographic printing on, for engraving (Anal.), 372
— — By E. L. Turner, 460
Working-up, aids to. By Thermit, 691
Workshops, photographing. By Practicus, 456

X

X-ray directors, G. G. Campion (Pat.), 162
— fluorescent screens, characteristics. By M. D. Hodgson, 191
— in industry, 226
— negatives, half-tone blocks of, 323
— paper, E. E. Burnett (Pat.), 417
— — with opaque coating, G. W. K. and T. P. K. Crosland (Pat.), 208
— photographs at the R.P.S., 633
— — definition. By A. Lumière, 183
— plates, sensitiveness of, measurements, 250
— — speed of, recent progress, 13

Y

Yellow dye, new, and light-filters made from it. By C. E. K. Mees and H. T. Clarke, 48

Z

Zeiss factory acquired by British optical firms, 199
Zeppelin raids, *British Journal* offices in, 1

AUTHORS' INDEX.

Aldis, Bros.—
Development of British lenses for aircraft photography, 264
Appleton, W. B.—
Development of British lenses for aircraft photography, 243
Arbaseer, G.—
Focussing screen for photo-micrography, 363
Photo-micrography without a microscope, 483
Avery, S. H.—
Spotting prints, 694
B. (C. E.) (Benham, Charles E.)—
Stereoscopic photography, 290, 307, 346, 378, 406, 725
Barnes, C. Brangwin—
Bromide printing, past and present, 204
Glazing troubles and remedies, 316
Local views as postcards, 395
Barrie, Newton—
Commission system for receptionists, 37
Bidgood, H. W. G.—
Comparison of the density of negatives, 637
Brock, A., and Holst, L. J. R.—
Future of aeroplane photography, 87
Burchall, P. R.—
Elementary survey of the present position of aerial photogrammetry, 695
Burrell, G. F.—
Training the retoucher, 174
Charles, D.—
Bichromate-mercury intensifier, 172
Camera movements, 331, 348, 364
Enlarging and reducing in true-to-scale processes, 736
The photographer's assistant, 142
Clarke, H. T., and Mees, C. E. K.—
New yellow dye and light-filters made from it, 48
Clerc, L. P.—
Drying with spirit: cause of white deposits and the drying efficiency of spirit, 259
Estimation of height of objects by measurement of their cast shadows in aerial photography, 296
Limit of admissible angling in vertical or horizontal photography, 297
Lowering of the horizon line in photographs taken from high view-points, 295
Photographic correction of negatives taken obliquely, 396, 411, 428, 440
Collingridge, Harvey—
True-to-nature photographs, 249
Cousin, E., and Equer, M.—
Tests of the action of a shutter of the focal-plane type, 280

CRABTREE, J. I.—
Chemical fog, 97
How to prepare photographic solutions, 365, 379, 395, 410
CRAIN, G. D., Junr.—
New business uses for commercial photographs, 635
Price policy in commercial photography, 662
CROWTHER, R. E.—
Modified bleacher in chromium intensification, 700
DAVIS, CHARLES H.—
From studio to home portraiture, 453
Outdoor and garden portraiture, 487
DEBENHAM, W. E.—
Dark-slides out of register, 51
Value of expression in portraiture, 100
DENCH, ERNEST A.—
Bribing the children, 716
Making money with a cinematograph camera, 661
DOUBLEDAY, J. W.—
Soft effects in enlarging, 158
DYKES, E.—
Night photography, 484, 501, 516, 528
EQUER, M., and COUSIN, E.—
Tests of the action of a shutter of the focal-plane type, 220
FIRMIN, H. F.—
Carbro printing process, 563
GLUMBAY, E. J.—
British photographic materials and foreign markets, 283
British plates in Switzerland, 756
GOSSOLD, A. VERNON—
Fourteen points on colour, 261, 276
GRAHAM, J.—
Lithographic transfers from bromide prints, 185
Silvering mirrors, 156
GREENE, G. W.—
A small finishing plant, 740
HALL, J.—
Merits of gaslight papers, 329
HARRISON, EDWARD LEE—
Pinhole photography, 738
HAUSBRAUN, J.—
Development of British lenses for aircraft photography, 243
HENDERSON, ARNETTE—
Improvements in optical and enlarging lanterns, 720
HODGSON, M. B.—
Physical characteristics of X-ray fluorescent intensifying screens, 171
HOLST, L. J. R., and BROCK, A.—
Future of aeroplane photography, 87
HOWE, F. B.—
Methods and novelties in enlarging, 546
HUGHES, SPENCER LEWIS—
Cameras for aviation photography, 293
HUNTER, E. KENNETH—
Testing lenses for process and copying work, 365
JAMESON, VIVIAN
An aid to mounting and mount cutting, 682
Device to facilitate the cutting of plates for small cameras, 564
Flash handle for cameras, instrument cases and lantern slide boxes, 697
KENNETT, W. B.—
Trade marks in China, 664
LOCKETT, A.—
Postcard lantern as an aid to copying and enlarging, 174
LOCKWOOD, R. B.—
Good photographs of difficult mechanical subjects, 217
LUBS, H. A.—
Para-amino-carvacrol—a new developer, 534
LUMIERE, A.—
Definition in X-ray photographs, 183
LUMIERE, A. and L., and SEYEWETZ, A.—
Chromium intensification with chlorochromates, 451
MACLEOD, M. N.—
Mapping from air photographs, 503, 518
MACNAMARA, CHARLES—
A method of multiple gum-printing, 320
MANLEY, E.—
Purple tones on bromide paper by re-development in daylight, 128
MANN, W. C.—
Development papers and desensitisers, 426
MCINTOSH, J.—
Filters for panchromatic plates, 317
MEES, C. E. K., and CLARKE, H. T.—
New yellow dye and light-filters made from it, 48
MOFFITT, W. H.—
A plea for the Ozobrome process, 531
MORSE, E. L. C.—
Specifications for a vest-pocket camera, 234
MOSS, H.—
Electricity and photography in warfare, 113
N. (A. J.)—
Costs in photo-engraving, 232
How to increase production and reduce selling prices of photo-engraving, 457
PORTER, A. W., and SLADE, R. E.—
Fundamental law for the true photographic rendering of contrast, 471
PRACTICUS—
Advertising the studio, 263
Artificial lighting, 50
Backgrounds in the portrait studio, 36
Blinds and curtains, 530
Bromide wrinkles, 707
Business methods of a portrait studio, 291
Camera and lens for studio portraiture, 11
Carbon printing, 675, 692
Changing quarters, 639
Children, photographing, 312
Combination printing, 587
Copying, 200
Dark-room and its fittings, 392
Enlargements, 247
Flashlight portraiture, 617
Flashlight work, 601
Hand cameras for professionals, 268
Handling the studio camera, 215
Heating and ventilation of studios, 111
Home portraiture, 172
Intensifying portrait negatives, 439
Lenses for the studio, 232, 349
Lighting, studio, 3
Leaky studio roofs, 616
Managing the sitter, 23
Miniatures, 650
Mounts and mounting, 278
Natural poses of the figure, 724
PRACTICUS (*Continued*).
Old people, portraits of, 333
Outfit, the question of, 633
Personal factor, 470
Plates and their work, 391
Portable studios, 186
Posing the head, 423
Postcard studio, 125
Printing portrait negatives, 559
Printing processes for portraiture, 70
Printing room, 140
Reception room, 156
Reduction of negatives and prints, 499
Repairs and renovations to apparatus, 408
Reproduction of negatives, 739
Retouching, 752
Storage of negatives, 489
Studio accessories and furniture, 83
Studio exposures, 49
Surroundings of the studio, 95
Telephoto lenses for professional work, 647
Wedding groups, 577
Workshop jobs, 456
RENWICK, F. F.—
Colour values in monochrome and a new viewing filter to assist in obtaining them, 334, 351
RICHARDSON, S. S.—
Carbon printing by artificial light, 35
RYDER, LA VERNE T.—
Photographs as evidence, 276
S. (E. A.)—
Masked prints with printed-in border tints, 314
Multiple vignettes with print-out papers, 468
Vignetting for daylight-printing papers, 648
SLADE, R. E., and PORTER, A. W.—
Fundamental law for the true photographic rendering of contrast, 471
SEYEWETZ, A., and LUMIERE, A. and L.—
Chromium intensification with chlorochromates, 451
SMITH, W. J.—
Photo-litho negatives, 80
STIBBS, E. M.—
Side lines for professional photographers, 158
STINE, G. F.—
Firing and washing of prints, 205
STOKES, C. J.—
Panoramic photographs and perspective, 67
STOKES, HERBERT G.—
Efficiency in the workroom, 575, 588, 603
STORR, B. V.—
Photographic materials and processes, 13, 27, 605
THERMIT—
Dodging the working-up, 691
Production of perfect sepias, 563
The art of negative making, 619
TILNEY, F. C.—
Personal impressions of the London Salon, 560
Royal Photographic Society's Exhibition, 516
TURNER, E. L.—
Printing on wood for engraving, 460
WALL, W. W.—
Silvering mirrors, 370
WILLIAMSON, COLIN M.—
Evolution of aerial cameras during the war, 309
WILSEY, R. B.—
Intensification and reduction with pyro developers, 721

NOTE TO SUBSCRIBERS WHO BIND THE "COLOUR PHOTOGRAPHY" SUPPLEMENT SEPARATELY.

Owing to exigencies of "make-up" it has not been possible to include in this index sheet a title page for the 1919 volume of the "Colour Photography" Supplement. For the convenience of those who bind the "Colour Photography" Supplement separately the publishers have had printed a few title pages, with index, of the Supplement, and will be pleased to send one of these sheets on application.

COLOUR PHOTOGRAPHY.

VOL. XIII.—1919.

INDEX.

The following abbreviations are used in the Index to indicate the nature of the subject matter :—

(Pat.) Patent. **(Dec. Pract.) Decennia Practica.**

Apparatus for colour photography, essentials. By R. M. Fanstone, 41
Autochrome photography, effect of the light-filter. By B. E. Havelock, 22
— plates, simplified developing. By A. and L. Lumière and A. Seyewetz, 37
Autochromes by artificial light. By C. J. Belden
— for lantern-slides. By R. M. Fanstone, 45

Books on colour photography, 24
Bromoil, three-colour, enlargements from Joly type negatives. By S. H. Williams, 15, 18
Butler three-colour camera, registration (Cor.), 36
Carbon tissue for multi-colour prints (Dec. Pract.), 12
Cellulose ester cum colloid two-colour screen films, 46
Cheron prismatic dispersion process (Dec. Pract.), 20
Christensen's patent, three-colour sensitive units, 43
Cinematography, six-colour, J. Shaw (Pat.), 26, 29
— two-colour, Douglass, 2
— — Hamburger (Pat.), 13, 17
Colour photography, where we stand, 21
— transparencies from colour-sensation negatives, F. E. Ives (Pat.), 9
Colour-sensitising dyes, preparation of. By L. E. Wise, E. Q Adams, J. K. Stewart, and C. H. Lund, 34
Composite colour process, Hess-Ives patent, 5
Copper and iron toning for two-colour prints or films, F. E. Ives (Pat.), 38

Diffraction process (Wood) of colour photography (Dec. Pract.), 7
Douglass two-colour cinematography, 2
Drac system of direct colour photography (Dec. Pract.), 7
Dye-image colour process, Christensen patent, 48
— mordant process, new photographic. By F. E. Ives, 1

Gorsky, Prokudin, colour process, 48

Hamburger two-colour cinematography, 13, 17
Hess-Ives composite mosaic and full-tone colour process, 5

Imbibition screen-plate colour process, Pedersen patent, 8.
Iron and copper toning for two-colour prints or films, F. E. Ives (Pat.), 38
Ives, F. E., composite mosaic and full-tone colour process, 5

Lantern-slides by screen-plate processes. By R. M. Fanstone, 45
Light-filter in Autochrome photography. By B. E. Havelock, 22
Lippmann process of direct colour photography (Dec. Pract.), 3

Mars-star pseudo-colour process (Dec. Pract.), 4

Paget colour process, excluding dust from the plate, 12
— — care of screens and filters, 14
Paget colour process for lantern-slide making. By R. M. Fanstone, 45
— — making the transparency, 24
— — transparencies, registering, 44
Pedersen, H., imbibition screen-plate colour process, 8
Pinaverdol and pinacyanol, preparation of. By L. E. Wise, E. Q Adams, J. K. Stewart, and C. H. Lund, 34
Prismatic dispersion for photography in colours (Dec. Pract.), 12, 20, 27
Prizma colour cinematography, a correction, 20
Prokudin-Gorsky colour process, 44
Pseudo-colour processes (Dec. Pract.), 4, 11

Review of colour photography. By H. E. Rendall, 31, 33

Screen-plate, colour, exposure hints, 40
Shaw six-colour cinematography patent, 26, 29
Smith (J. T.), patent cellulose ester cum colloid two-colour screen films 46
Solgram colour prints (Dec. Pract.), 4

Three-colour, a blind alley? (Cor.), 36, 39, 44
— sensitive units for colour photography, J. H. Christensen's patent, 43
Transparency viewing apparatus and retouching stand combined, 23
Two-colour prints or films by copper and iron toning, F. E. Ives (Pat.), 38
— screen films, J. T. Smith (Pat.), 46

Wood diffraction process (Dec. Pract.), 12

AUTHORS' INDEX.

Adams, E. Q., Wise, E. L., Stewart, J. K., and Lund, C. H.—
Laboratory preparation of the colour-sensitising dyes, pinaverdol and pinacyanol, 34

Belden, C. J.—
Autochrome photography by artificial light, 25

Fanstone, R. M.—
Essential features in apparatus for colour photography, 41
Lantern-slides by the screen-plate process, 45

Havelock, B. E.—
Light-filter in Autochrome photography, 22

Ives, F. E.—
New photographic mordant dye process, 1

Lumière, A. and L., and Seyewetz, A.—
Simplified method of developing Autochrome plates, 37

Lund, C. H., Wise, L. E., Adams, E. Q., and Stewart, J. K.—
Laboratory preparation of the colour-sensitising dyes, pinaverdol and pinacyanol, 34

Rendall, H. E.—
Review of colour photography, 31, 33

Seyewetz, A., and Lumière, A. and L.—
Simplified method of developing Autochrome plates, 37

Stewart, J. K., Wise, E. L., Adams, E. Q., and Lund, C. H.—
Laboratory preparation of the colour-sensitising dyes, pinaverdol and pinacyanol, 34

Williams, S H.—
Three-colour Bromoil enlargements from negatives of the Joly type, 15

Wise, L. E., Adams, E. Q., Stewart, J. K., and Lund, C. H.—
Laboratory preparation of the colour-sensitising dyes, pinaverdol and pinacyanol, 34

APPENDIX.

The following Supplementary Index includes the entries referring to articles, etc., on colour photography which have appeared in the "British Journal of Photography" during 1919.

Colour cinematography (Pat.), 16, 386
— — digest of recent processes, 27
— photography and cinematography (Gorsky and Rodgers and Finnigan), 537
— — composite mosaic and full-tone process, Hess Ives Corporation (Pat.), 61
— — copper and iron toning, Hess-Ives Corporation (Pat.), 578
— — mosaic imbibition process, H. Pedersen (Pat.), 61
— — screenplate, Dufay, 606
— — — J. T. Smith (Pat.), 712
— — sensitive units for, J. H. Christensen (Pat.), 652
— — transparent sensitive emulsion for three-colour films, J. H. Christensen (Pat.), 639
— — two-colour process, Friese-Greene (Pat.), 728
Colour-sensitive emulsions, F. F. Renwick and another (Pat.), 699
Colour values in monochrome, and a new viewing filter. By F. F. Renwick, 224, 334, 351
Dufay colour screen-plate, 606
Dye-toned images, F. E. Ives (Pat.), 6
Dye-toning of lantern slides, 598
Eastman yellow, new dye for light-filters, 48
Emulsions, sensitive, transparent, J. H. Christensen (Pat.), 639

Lantern-slides, dye-toning, review of recent processes, 598
Panchromatic photography, Ilford booklet, 478
— plates, filters for. By J. McIntosh, 317
Prisms and grid for dividing light-pencils. D. F. Comstock and another (Pat.), 492
Raydex three-colour printing, F. R. Newens (Soc.), 653
Vision filters for orthochromatic photography, Ilford, 474
Yellow dye, new and light-filters made from it. By C. E. K. Mees and H. T. Clarke, 48

PATENTS, AUTHORS OF—

Bloch, O., and another—colour sensitive emulsions, 699
Christensen, J. H.—sensitive units for colour photography, 652
— — transparent sensitive emulsion, 639
Comstock, D. F., and another—prism and grid for dividing light-pencils, 492
Douglass, L. F.—colour cinematography, 16
Friese-Greene, W., and Garrett, F.—colour sensitizers for two-colour photography, 728

Patents, Authors of (*continued*).
Hess Ives Corporation—colour photography, 61
— — and another—colour photography, 578
Ives, F. E.—colour photography, 61
— — dye-toned images, 6
— — and another—colour photography, 578
Pedersen, H.—colour photography, 61
Renwick, F. F., and another—colour sensitive emulsions, 699
Shaw, J.—colour cinematography, 386
Smith, J. T.—colour screen-plates, 712
Technicolor Motion Picture Corporation and another—prism and grid for dividing light-pencils, 492

AUTHORS.

Clarke, H. T., and Mees, C. E. K.—
New yellow dye and light-filters made from it, 48
McIntosh, J.—
Filters for panchromatic plates, 317
Mees, C. E. K., and Clarke, H. T.—
New yellow dye and light-filters made from it, 48
Renwick, F. F.—
Colour values in monochrome and a new viewing filter to assist in obtaining them, 224, 334, 351

HENRY GREENWOOD & CO., Ltd., PUBLISHERS,
24, WELLINGTON STREET, STRAND, IN THE COUNTY OF LONDON.—December 26, 1919.
Printed by St. Clements Press, Ltd., Portugal Street Kingsway, in the same County.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3061. Vol. LXVI. FRIDAY, JANUARY 3, 1919. Price Twopence.

Contents.

	Page
Ex Cathedra	1
British and German Lenses	2
Practicus in the Studio. By Practicus	3
Assistants' Notes	5
Exhibitions	5
Forthcoming Exhibitions	5
Patent News	5
New Books	6
Meetings of Societies	6
Commercial and Legal Intelligence	7
News and Notes	7
Correspondence—The Assistant Question—The Problem of Relation	7
Answers to Correspondents	8

The Summary of contents which usually occupies the lower half of this column will be found at the foot of the page overleaf and will continue to be placed there whilst its regular position is required for notices relating to the forthcoming "B.J. Almanac."

The Indexed Almanac.

We may, perhaps, be excused for thinking of the Almanac as one of the best indexed of photographic manuals. But we endeavour to make the index a fitting counterpart of the very many and varied items of information which are contained in the Almanac. Indexing, as anybody knows who has done any of it, is work which calls for patience and discretion in about equal measure. The discretion consists in choosing the entries in the index which are likely to be looked for by a reader who obviously knows nothing of the indexer's method. From that point of view we hope that the reader will find the index to the forthcoming Almanac a speedy and reliable means in seeking any item, however small, in its many pages. It is not until we come to compile the index to the Almanac that we realise the immense amount of practical information which it contains. The index is therefore contrived so that it may fulfil its proper function of pointing to every piece of contents, and of doing this no matter from what point of view the seeker regards a particular subject. For example, the process of making line drawings from bromide prints is indexed both under "Bromides" and under "Line," and the same applies to scores of other items.

The index this year is further reinforced by the inclusion of the many words, terms, and expressions commonly used in photography which are the subject of the article "Photographic Definitions," in which their meaning and practical significance are briefly explained. The article thus supplies a readable and not unduly disjointed survey of practical photographic methods, whilst the index supplies the means for the beginner to ascertain the meaning of any particular word or term which he may seek.

And in this reference let it not be omitted that the goods advertised in the Almanac are also the subject of a separate index, from which is seen the makers or dealers supplying any given article together with the page of the Almanac on which their advertisement appears.

EX CATHEDRA.

A Hand Camera Pioneer. In a recent article by Mr. Ward Muir in which he pays tribute to the memory of the "old master" of camera-making, George Hare, he asserts that the conservative nature of that gentleman led him to avoid the construction of hand-cameras. This is hardly correct as Mr. Hare made many of the earlier box-form hand-cameras, most of which were to the order of Mr. Dallmeyer. We believe also that he was the originator of the type of camera in which the front board folds up and encloses the lens and shutter, as in the Una and Alpha of to-day, or we might even say the folding Kodaks. This early instrument was called the "box-form camera," and was fitted with a rapid rectilinear lens in the usual mounting with a T.P. shutter fixed upon the hood, which made it rather bulky. The bellows had double extension and were made wide at the front so that a pair of stereo-lenses could easily be accommodated. We believe only a few of these cameras were made as they were for half-plates only, and the early hand-cameras were nearly all for quarter-plates. Mr. Hare's cameras were noted not only for their beautiful workmanship, but for the studied simplicity of design, no fitting being added unless it were really useful.

* * *

The Patent Office Library. A new facility has just been added to the library of the Patent Office, Southampton Buildings, London, W.C.2. It is now possible to obtain a photographic copy of any document in the library, such as the page of a book or periodical. A photographic department for this purpose has been set up in a room adjoining the library. It is fitted with a Photostat machine with which either negative or positive copies are supplied, according to an official tariff. The provision thus makes it possible for any member of the public to obtain accurate reproductions of passages or pages in books which are out of print, and presumably such official copies will be accepted in courts of law as equivalent to the production of the original volumes. In making this reference to the further service being rendered by the Patent Office Library, it may be mentioned for the benefit of those who do not know the library that its collection of technical books is probably the finest in the country, whilst the freedom with which the shelves may be consulted makes it unique among public institutions. It includes an exceedingly comprehensive set of photographic books and periodicals.

* * *

German Bombs. With the publication of the official report on the air raids on London it is now permissible for us to refer to the incident of October 13, 1915, when two bombs from an enemy airship

fell, one immediately to the rear of the "British Journal" offices and the other in the middle of the roadway nearly opposite their frontage. The force of the latter naturally shattered and blew in all the windows and did some other minor damage, but fortunately no life was lost. It was late in the evening, the "B.J." for the week had, in newspaper language, "been put to bed," the staff had gone home, and the caretaker and his wife, who, by a piece of luck, were in the rear portion of the building, suffered only the mental shock of the two successive explosions from the effects of which they have still not completely recovered. In a later aeroplane night raid, in which part of Covent Garden Market suffered, some slight damage was again done to the "B.J." offices. The souvenirs in the shape of twisted metal and splintered wood, which have been preserved from these assaults, are not necessary to keep in our minds the sense of loathing for the nation by whom these acts of murder were planned. We do not disguise from ourselves that they were kindness in comparison with scores of others committed according to plan during the course of the war. But, naturally, their effect upon ourselves as eye-witnesses was disproportionately great. At any rate their occurrence and the recollection of what others have suffered in similar raids will confirm us in our policy of having nothing to do with advertisements of German goods.

* * *

Red Tones on P.O.P. A pleasing relief from the sepia and black tones which now dominate the showcase may be obtained by using matt P.O.P. toned to a red tint. The colour, while not actually that of a red carbon, is quite distinct from the brown and purple tones usually obtained by gold toning. The process used is quite simple and differs in no way from the separate toning and fixing with which we are all familiar; in fact by prolonging the toning very pleasing browns may be obtained. Glossy paper may be used, but is not as a rule so satisfactory as the matt variety. The phosphate toning bath is recommended, and is made as follows: Phosphate of soda, 30 grains; water, 10 ozs.; chloride of gold, 1 grain. The prints are washed as usual until the milkiness quite disappears: four changes of water with five minutes immersion in each are usually sufficient. They are then transferred to the toning solution, only one print being toned at a time. It is a good plan to take one print and lay it in a dish of clean water by the toning bath, while the toning is done, to serve as a guide. As soon as the print in the toning solution shows a distinct change it is put straight into the hypo bath, which should not be stronger than two ounces to the pint, and another print toned. The toning only takes a few seconds, and it is impossible to obtain even tones if a number are toned at once. Although there is so small a quantity of gold deposited, the prints stand very well, some now over fifteen years old having shown very little deterioration. It may be well to note that the toning solution should be made one hour before using, and that it should then be used up, as it does not keep more than a few hours.

BRITISH AND GERMAN LENSES.

With the prospect of the photographic industry revertiug from its war preoccupations, it is natural that interest should be taken in the progress of those branches of it which previously were in keen competition with German makers. Of these that of lenses presents itself in the first place, and we are glad to see that the question is being energetically discussed in our contemporary, "The Photographic Dealer," where Mr. James A. Sinclair has called for a candid examination of the matter from several points of view. His letter has quickly elicited some interesting opinions, chief among which perhaps is the statement of Mr. Oglesby (of Messrs. Sands Hunter, and therefore in a position to test the pulse of the lens-buying public), to the effect that purchasers of second-hand lenses at the present time are prepared to pay a premium of 50 per cent. on the list price for German anastigmats of repute, whereas British instruments of similar rank barely command the list price. The experience is one which is in accordance with the general preference among photographers, and it emphasises the necessity for the energies of those in the lens industry to show that it has its origin in the propaganda industriously carried on by the German makers. Few photographers, and probably still fewer of those engaged in retailing lenses, have adopted Mr. Sinclair's practice of submitting lenses to authoritative tests. They have been content to assume that a German lens was, as a matter of course, superior to a British one, and, given that initial bias, it is perfectly natural that in such qualitative work as photography the actual optical performance goes undiscovered even when, which is rarely the case, comparative camera tests are undertaken.

But to-day we are in a position to destroy this tradition. The war, in which optical definition of aerial photographs has been a vital factor, has, so to speak, enlisted British and German opticians in a trial of strength; a trial, how-

SUMMARY.

The first of a short series of articles by "Practicus" deals with the elements of lighting in portraiture. Simple directions are given for arranging the blinds, the abuse of the reflector, and other matters. (P. 3.)

Now that hostilities are suspended, we are getting some idea of the marvellous developments in lens manufacture which have occurred during the war. British lenses have decisively beaten the German product, and we hope that we shall hear no more about the "superiority" of the latter. (P. 2.)

The "B.J." offices came in for their share of damage from enemy air-raids. D.O.R.A. now permits us to give some account of the happenings on page 2.

A simple method of obtaining red-toned prints on matt P.O.P., using the ordinary materials, is given on page 2.

An important innovation has been made at the Patent Office Library, it being now possible to have documents, drawings, or pages of books reproduced by the Photostat. Details of the procedure will be found on page 1.

A note on the late Mr. George Hare's part in the evolution of the hand-camera finds place on page 1.

Under the heading of "Patent News" will be found specifications of an automatic light switch for plan-copying machines and dye-toned images. (P. 5.)

An easy method of converting formulæ expressed in terms of the metric system into apothecaries' weight is given under "Assistants' Notes on page 5.

A very successful exhibition of British scientific products is being held at Manchester. We print some descriptions of objects of photographic interest on page 7.

The assistants' question and the problem of halation are the subjects of correspondence on page 7.

Changing bags, flashlight work, and studio lighting are among the subjects dealt with in "Answers to Correspondents." (P. 8.)

The new issue of "Photograms of the Year" is noticed on page 6.

"Colour Photography" Supplement.

Dyed images specially for colour cinematography are much in evidence just now. Mr. F. E. Ives gives full particulars of an improved mordanting process in an article on page 1.

Another dyed-image method, by which alternate cinematograph images are dyed red and green, the one set of pictures being protected by a removable coating of varnish while the other is being dyed, is detailed on page 2.

Decennia Practica is devoted to the Lippman or interference process of colour photography, an improved method of making the emulsion being described, and to pseudo-colour processes. (P. 4.)

ever, in which the British contestant was handicapped by the fact that in the past he had relied upon his antagonist for the staple and highly finished material for the manufacture of his lenses. With the removal of the restrictions imposed by D.O.R.A., it is permissible to say that in this unequal contest the British optician has proved himself superior. With glass that is wholly of British manufacture he has produced instruments which optically are not merely superior to those of the Germans, but much superior to them. Test photographs which we have seen—tests designed to provide rigid photographic records—emphasise this fact in respect to lenses of different types successively originated by both British and enemy designers as progress in aerial warfare forced the photographic machines higher and higher in the air. And let it be understood that the degrees of optical performance in regard to which these comparisons have been made are very high ones. They represent a much more critical definition than would be ample for ordinary photographic purposes. Some idea of the character of the results will be gathered when it is stated that in aerial photographs taken with these all-British lenses at the height of 15,000 ft. it has been possible to note the presence of barbed wire. It is in this domain of high performance that the British lenses have beaten the German. We would go as far as to think that the superiority of the British aerial photographs has been a material factor in the defeat of the enemy, and we want the fact to be remembered if and when we should hear anybody again taking it for granted that in optical matters the Germans are unsurpassed. It amounts to this. There has been a competition in which the prize was the most colossal the world has known for a specific optical result. The German has come out second, though circumstances were immensely in his favour. Capt. Hetherington, in the "Photographic Dealer," has told us as much as this, and as the officer responsible for the supply of lenses to the Air Forces no one is in a better position to know than he. A more detailed and technical account will, we hope, be published; it is a duty which the Air Board owes to opticians who have served it.

It follows from what has been said that we may expect the British lens manufacturers to lose no opportunity which is open to them to maintain, spread, and develop the reputation which their instruments should rightly enjoy here and abroad. We do not care particularly what means they employ, but whatever they are, they should plainly be employed more abundantly than in the past. The suggestion has been made that makers of lenses should collectively emphasise the merits of British lenses. The suggestion may be of value if the effort is made in supplement to others—an extra item in a total of propaganda. But we are disposed to think that the form rather than the mode of bringing British lenses before the photographic public is the matter which calls for an imaginative and constructive policy. Lenses are bought largely by people who value them very properly, purely in accordance with the results they will produce. Most purchasers of them don't care twopence about their optical principles. Without knowing anything else about a lens they will buy it because, for example, the maker exhibits photographs taken with it on an expedition in Patagonia, inferring that the explorer would choose the best lens he could get. The appeal by result was in the past employed about as liberally by the Germans as it was neglected by the British opticians. Let our lens makers realise that the tests by which they value their instruments mean no more to the average user than the chemical analysis of a sample of cocoa does the housewife. The cocoa maker is a notable user of pictorial advertisement; the lens maker, on account of the direct relation between the picture and the article to be sold, has much better reason to pursue this method, which, of course, is not the only one that may be adopted.

In whatever propagandist programme may be evolved, the dealer must necessarily take a part. As the person who comes immediately in touch with purchasers, he can assist as no one else can. A leading dealer has recently referred to the assistance given to dealers through the advertising by the German makers, and has mentioned the more favourable terms on which German lenses were retailed. It is a purely commercial view, a view which any business man quite properly takes, but nevertheless we are prepared to say a view which can be too exclusively taken. In the selling of comparatively costly articles, such as a highly priced lens, the customer of a dealer rightly expects to benefit in his purchase from the knowledge of the goods which the dealer (presumably) possesses. It is perhaps a rather altruistic aspiration, but is it too much to expect that a dealer will pay a measure of regard to this part of his function? In the interests of British lenses, which for the present at any rate are his interests, it is hoped that it is not too much. But whatever may be the degree to which the uncommercial element may enter into the dealers' transactions, there is now the occasion for the dealer to add the weight of his influence on the side of British lenses in the direct and personal way which is possible to him. How many dealers, we wonder, have sent a lens to the National Physical Laboratory for their own information? How many have done more than display showcards and printed matter? We should like to see dealers take up a more discriminating rôle in their supply of lenses, and we are sure that is what lens makers in this country would like them to do.

PRACTICUS IN THE STUDIO.

A TALK ABOUT LIGHTING.

Lighting the sitter is one of the most difficult subjects to discuss upon that could well be chosen, for so narrow is the margin between success and failure that it is not possible to give definite rules which will ensure the same results under different conditions; in fact, so far is this true that there is a legend that one successful portraitist abstains from having his windows cleaned lest the lighting should thereby be rendered too hard.

Nearly every competent writer on the subject has recommended the study of lighting to be begun with a plaster bust, and with this I heartily agree. The only thing better would be to follow the example of Adam Salomon and have life-sized wax figures with hair and clothes complete. A life-sized bust is not an expensive luxury even in war-time, for I recently purchased one near Hatton Garden for five shillings. It was the head and shoulders of Gibson's Venus, and has not special pretensions to classical beauty; it is just a moderately good-looking young woman with her head well balanced upon her shoulders. Busts having the head in unusual positions should be avoided, as the lighting which might suit them will not be useful for sitters.

Having got our bust, the first thing to be done is to give

it a coat of buff or very pale terra-cotta distemper, so that the light values will be about the same as those of the living model. This is very important, as white plaster reflects far too much light for our purpose. The reason why I advocate the use of a bust instead of a living sitter is that the latter cannot keep still for the time required for study, and the student will quickly see how a slight movement of the head upsets all his plans for obtaining a certain effect.

The bust must be placed on a table so as to be about the height of an ordinary sitting figure, and in front of a plain medium-toned background. It should be in such a position that a high side light falls upon it, the light being rather to the front of the object. In an ordinary span-roof studio this would mean that the dark blinds or curtains would be drawn over one end of the studio, both top and side, for about five feet. The bust should be about three and a half feet from the end wall. the next blind should be half-down and the next quite open; the side light is obscured up to nearly five feet from the ground, and is open for about six feet run. If we now examine the lighting we shall find it fairly round, but rather contrasty. This is all for the best, for we can readily see the effect of altering the positions of the bust, the blinds and the camera respectively. One golden rule, by whom originally written I know not, is that "light from the sitter's end of the studio gives contrast, while light from the camera end gives softness." I cannot too strongly impress this fact upon the beginner. In ordinary circumstances, if the lighting is too harsh, open more blinds over the camera end; if too soft, close them over the camera and open them near the sitter. This one rule is the key to simple lighting, and its application will prevent much floundering in the early stages. If we do not want to alter the blinds we may move the sitter; if she goes further under the dark blinds we get softness; if she comes forward we get contrast.

Excess of top-light is the commonest fault in portrait lighting; but there are times when top-light is needed. A flat face with insignificant features calls for it, as Mr. H. P. Robinson says: "I think I should use a good deal of vertical light in taking the portrait of a Chinaman." If the sitter had strong features and deep-set eyes such a lighting would be disastrous. We may now try the effect first of turning the bust to and from the light, and you will quickly see how the modelling of the face is affected. As we turn the nose to the light the further cheek becomes illuminated, while as we turn it away it sinks into shadow. I would ask you to remember that neither the camera nor the sitter is screwed to the floor, so that you can obtain the same position of the head, but with very different lightings, by turning it till the desired effect is obtained, and then placing the camera in the position whence you observed it. Always keep your eyes open for accidental effects of lighting, and note the sitter's position in the studio for future use; some of these "observed" lightings are much better than those carefully arranged. I have nearly always found that the effects obtained with dark blinds and clear glass only are rather too vigorous for the ordinary run of work, hence it is very desirable to have in addition very thin white blinds or curtains so as to diffuse the light a little and tone down the glaring effect of the high-lights. If there are no white blinds an ordinary circular head-screen covered with thin nainsook or pale-blue nun's veiling is very useful. The nearer this is placed to the sitter the softer will be the lighting, and vice versa. In studios which are so placed that direct sunlight falls upon the glass during any period of the day white blinds should be used to cover all the glass. I have worked in this way in a studio facing due west, on which the sun shone from 11 a.m. until evening. In such a studio we must not have too large an expanse of white-covered window open at once, or we shall get flat negatives.

A point which should never be lost sight of is that the actual design or pattern of the studio is of no moment. So long as the light can be made to fall upon the sitter at the desired angle, ridge roof, single slant, top-light, high side-light will all give the same result if properly handled. Much more depends upon outside influences; trees, walls, other buildings all serve to modify the lighting, and an arrangement of blinds which will suit the sitter in one studio may fail to do so in another which is differently placed.

A lofty studio is not to be desired. I remember one clever photographer who said that he would work under a cucumber-frame if he could. In a high-roofed studio the light is very difficult to control, as it is too far away from the sitter. Even, soft effects are easily obtained, but when any decided lighting is needed it becomes necessary to close all the blinds and to use the side-light only, and that only in a limited area.

A few words on unusual forms of studio may not come amiss. When working in a studio which has top-light only, the sitter must be placed well back under the dark blinds, and plenty of light admitted from the "camera end." It is also often advantageous to turn the sitter slightly to one side of the studio and to work the camera close to that side of the studio towards which he is looking, the background being, of course, placed diagonally across the corner. In a studio with a high side window only it is often necessary to place the sitter as close to the window side as possible, so as to get the effect of top-light. If too low a side-light be used the eyes are filled with light and look flat. What is sometimes called a "miniature-painter's light" is a high front light. This gives a very even illumination of the face, but if properly managed there should be sufficient shadow on one side to avoid flatness. If it be desired to copy the lighting in an existing photograph or even a painting, if by a good artist, the spark of light in the eye forms a reliable guide as to the position of the dominant light. If this be high or nearly in the centre of the top of the iris, in the position say of 11 o'clock on a watch dial, it denotes a high front light, if in the position of 9 o'clock a low side light, and so on In some fancy lightings it may even be at 6 o'clock, which shows that the light comes from below.

I will now deal briefly with screens and reflectors. The head-screen I have already dealt with as far as lighting the features is concerned, but it has other uses, such as subduing the light on white drapery. Nothing is more objectionable than to have a white dress brilliantly illuminated, making the face appear too dark and receding into the background. By use of the small head-screen this may be avoided, the shadow being cast where required. In some cases a screen covered with a thin open black material is useful, as it will cast a shadow without diffusing white light in other directions. Reflectors are usually relied upon too much; only when the lighting is nearly satisfactory but the shadows are too dark should they be introduced, and then not placed close up to the sitter. In this position they destroy all the modelling on the shadow side and give an unnatural appearance. It is unfortunately too common for the operator to make a hard lighting and then to use the reflector to even up the face. This is wrong, as it does nothing to subdue the overlighting on the other side. There is no need to be afraid of using a screen or white blind to soften the high-lights, as it does not cut off any light from the shadows which are still receiving front light and reflected light from the studio. If the same exposure be given with the high-lights screened the negative can be developed for the shadows without the high-lights blocking up.

In conclusion, I would caution the tyro against judging lighting by the eye alone, the negative being the only test. The plate does not always see the sitter in the same way as the operator does. Some plates have a tendency to intensify the light, while others soften it. The lens also has a say in the matter, a short-focus lens usually giving a more brilliant negative than a long focus one does. This is partly due to scattered light in the studio, but it also seems to be caused by the distance between lens and plate. Naturally the operator will see

that his lens is clean, his camera well blacked inside, and his dark-room light beyond suspicion before he starts work, or he is simply inviting failure in any attempt to secure good lighting. PRACTICUS.

Assistants' Notes.

Notes by assistants suitable for this column will be considered and paid for on the first of the month following publication.

Easy Conversion of Metric Formulæ.

ALTHOUGH the metric system of weights and measures has many advocates in the world of photography, it cannot be said that the average photographer or his assistant takes kindly to it, and many no doubt feel a little annoyed when a formulæ is given in gms. and c.c.s. with no accompanying equivalents, or at any rate quantities, in the more familiar English system of grains and ounces.

Several methods of conversion have been advocated, and all may be simple enough to expert mathematicians or those assistants who have time to get used to them, but the simplest plan, and one needing but little skill in arithmetic, is the following, when, as is usually the case, the constituents of a formula are given as so many gms. per litre (1,000 c.c.s.).

The plan is to reckon the 1,000 c.c.s. as 16 ozs. and multiply all the gm. quantities by 7, which plan will give the number of *grains* per 16 ozs. of solution, there being no real reason why the 1,000 c.c.s. should be reckoned as a pint of 20 ozs., as many appear to imagine, for as a matter of fact a litre is 35 ozs. and 94 minims.

As an illustration of this "rule of seven" plan the one-solution scalol-hydroquinone developer may be taken:

Water	1,000 c.c.s.		= 16 ozs.
Soda sulphite crystals	50 gm.	× 7	= 350 grs.
Scalol	2.5 gm.	× 7	= 17½ grs.
Hydroquinone ..	4.5 gm.	× 7	= 31½ grs.
Soda carbonate crystals	75 gm.	× 7	= 525 grs.
Pot. bromide	.5 gm.	× 7	= 3½ grs.

Sixteen, eight, or four ounces are quite as convenient as the more popular twenty, ten, and five ounce quantities. If, however, the worker prefers the 20 ozs. lots to the 16 ozs. given by the above system, the multiplying by seven can still be carried out, and when the figures are obtained they are simply divided by four, which gives, of course, the 4 oz. quantities, they being then multiplied by five to produce the quantities per Imperial pint.—L. T. W.

Exhibitions.

WALTER BENINGTON'S PICTURES AT HAMPSHIRE HOUSE.

THE third of the season's "one-man exhibitions" has now been inaugurated at Hampshire House, and the artist-author of the works on view is Walter Benington. This well-known photographer first won his spurs in the ranks of the amateurs, but soon he enlisted under the banner of professionalism, and speedily took that rank among the practitioners of the art to which his taste, technique, and versatility so fully entitle him. Though in recent years his work has more generally been shown at the Salon, in earlier days his pictures were to be seen at the Royal, and many other of the best galleries.

There are no fewer than sixty-four pictures at Hampshire House—enough to give visitors and students a fairly comprehensive idea of his aims and the media and methods by which he produces them. The show, which is open every day—excepting between 1 and 2 p.m.—is well worth a visit.

FORTHCOMING EXHIBITIONS.

February 20 to 22.—Leicester and Leicestershire Photographic Society. Secretary, H. C. Cross, 80, Harrow Road, Leicester.
February 22 to March 8.—Edinburgh Photographic Society. Secretary, George Massie, 10, Hart Street, Edinburgh.

A conversazione of the staff of Mr. F. A. Swaine, Southsea, was held on Friday, December 20, and was attended by nearly 100 persons. A most enjoyable evening was spent.

Patent News.

COMPLETE SPECIFICATIONS ACCEPTED.

These specifications are obtainable, price 6d. each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

PLAN-COPYING MACHINES.—No. 120,620 (Nov. 14, 1917).—The invention consists in a mechanical device adapted to be applied to practically any type of photo-copying machine for automatically extinguishing the light (and also preferably stopping the machine) at any predetermined point in the exposure of the print.

The device comprises an arrangement of cable, wire, or the like connected at one end to the lamp control switch, and suitably anchored at the other end; the cable carrying adjustable stops adapted to be operated by a part moving in relation to the lamp or the machine.

Figures 1 and 2 show the invention applied to the well-known pattern of stationary printing cylinder, in which Figure 1 is a

Fig. 2.

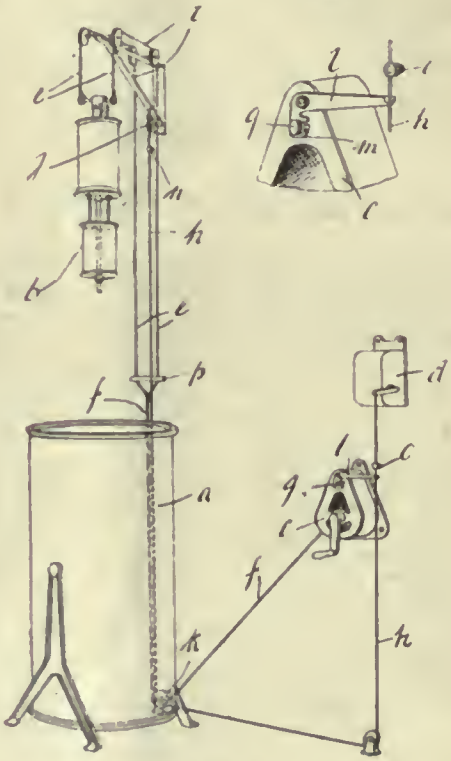


Fig. 1.

general perspective view of a copying machine of the type in which a movable lamp is lowered into a stationary, copying cylinder, and shows our invention applied thereto.

Figure 2 is a detail view of one part of our automatic control device.

a is the copying cylinder of ordinary construction with movable lamp *b*, winding gear *c* and light switch *d*. The winding gear *c* for the lamp supporting wires *e* and *f* may be operated by hand or motor for raising the lamp into the position illustrated. In the example given the gear *c* has a spring actuated knob *y*, which is drawn out to enable the lamp *b* to be lowered; a suitable braking arrangement on the gear determining the speed.

In applying the invention a wire *h* is attached at one end, preferably through the medium of a tension spring *j*, to a convenient fixed point and is passed downward parallel with and closely adjacent to or between the lamp wires *e* and under a pulley *k* at or near the base of the machine, and the other end of the

wire *h* (which is preferably arranged in close proximity to the lowering gear *c*) is connected to the handle of the lamp switch *d*. The lowering device is provided with a pivoted cranked catch or trigger *l* having a jaw end *m* adapted, whilst the machine is in operation, to engage and hold the spring-controlled knob *g* of the lowering gear in its outer or operative position. Each end of the wire *h* carries an adjustable stop, marked *n*, *o*, respectively, and the arrangement is such that as the lamp approaches the end of its travel as determined by the adjusted positions of the stops, a cross-bar *p* carried by the lamp wires *e* engages with the upper stop *n*, thereby exerting a pull on the wire *h*, which is transmitted to the switch handle and extinguishes the lamp. At the same time the stop *o* at the other end of the wire is drawn into engagement with and serves to release the cranked catch or trigger *l*, whereupon the spring-controlled knob *g* of the lowering gear is immediately returned to its inner position, and the downward movement of the lamp *b* is stopped.

The device can be applied to copying machines with rotating cylinders.—Arthur Sydney Baylis, Blenheim House, 2, Lowther Street, Coventry; and Bernard William Dawkins, Glencar, Spencer Avenue, Earlsdon, Coventry.

Dye-toned Images. No. 113,617 (Feb. 20, 1917).—Silver images are bleached in a solution of copper ferricyanide, the copper-toned image acting as a mordant for certain dyes. The details of the specification are given on another page in the "Colour Photography" Supplement.—Hess-Ives Corporation, 1201, Race Street, Philadelphia, and Frederic Eugene Ives, 1327, Spruce St., Philadelphia.

New Books.

Photograms of the Year 1918. Edited by F. J. Mortimer (London: Iliffe and Sons, Ltd. 5s. and 6s. net.)

A selection of the practical work of the year, exhibited and unexhibited, is offered for the twenty-fourth time in the 1918 "Photograms." The volume, which roughly may be taken as a reflection of the exhibitions, marks the predominance of portraiture and figure study and the neglect of landscape which have characterised the work of exhibitors during the last few years. The landscapes in this book which have a quality above the topographical can be counted on the fingers of one hand; portraits and figure studies fill three-quarters of its pages. The prohibition of outdoor photography will be pleaded in excuse, but the movement was well advanced before D.O.R.A. drove our cameras indoors. We could wish that our good friend Mr. W. R. Bland, in his rôle of fatherly and kindly commentator on these "pictures of the year," might urge the claims of landscape. He is evidently not supposed to do anything of the kind in "Photograms," but only to say a few words about each reproduction, but as he has managed this year to squeeze a little chapter on the soft-focus lens into these close-clipped comments, perhaps, with six months to think about it, he can find a way to insinuate the needed object-lesson among his observations of 1919. Among the other literary contents of the book are an expected and an unexpected contribution. Mr. R. Child Bayley writes one of his articles on the Royal Photographic Society, and Lieut.-Col. Moore-Brabazon sketches a new branch of aerial photography—the pictorial. The latter is a disturbing forecast for the critic, who must qualify as an aerial traveller if any weight is to be attached to his judgments.

Gossamer and Honey.—A little volume of poems bearing this title is among the latest publications of Mr. Arthur L. Humphreys, 187, Piccadilly, W. We cannot regard reviews of poetry as coming within our province, but the collection has an interest for us and for many of our readers as the work of Miss Joan E. V. Warburg, the 16-year-old daughter of Mr. J. C. Warburg. Having said this much, it may be permissible to observe that the poems exhibit, many of them, an imagination and sense of rhythm remarkable in one of so few years. They have a delicate air-bell kind of sweetness, and certainly promise gifts of exceptional character.

The Hands in Portraiture.—The latest issue, No. 172, of "The Photo-Miniature" is one which every professional photographer ought to get and study. It is a little treatise by the well-known New York photographer, Mr. Charles H. Davis, on the art of posing hands in portrait photographs. Mr. Davis is acknowledged as a master in the beautiful drawing of the hands which, with the aid of his own art, he makes the camera produce for him; even if he were not, the thirty-odd reproductions of his work, which form part of his scheme of instruction in this little book, would show him to be one of the comparatively few photographers who have realised the beauty of hands and succeeded in embodying it as an inherent part of a portrait. It would be useless to attempt to epitomise his manual. Suffice it to say that it is written by an artist—but an artist who has had to work under photographic conditions, and realises how advice, conceived in a spirit of pure art, requires to be tempered to others who must submit to the same limitations. And so it is not in the least an exaggeration to say that the little book is worth many times its price to any photographer. At present, so far as we know, it is not obtainable in England, but must be ordered direct from Messrs. Tennant and Ward, 103, Park Avenue, New York, with remittance of 1s. in British postage stamps or international coupons.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Saturday, January 4.

Rodley and District Photographic Society. Social Evening.

Monday, January 6.

Bradford Photographic Society. "A Chat on Pictorial Portraiture," with numerous illustrations. Mr. and Mrs. F. Toulson.

City of London and Crippiegate Photographic Society. "Straight versus Controlled Photography." R. H. Lawton.

Dewsbury Photographic Society. Annual General Meeting.

Tuesday, January 7.

Hackney Photographic Society. Opening of "One Man" Exhibition.

Wednesday, January 8.

Croydon Camera Club. "The Early Chapters of Photographic History." A. Mackie.

Edinburgh Photographic Society. "How to Make Enlargements." J. A. Angus.

Halifax Scientific Society (Photographic Section). Lantern Lecture at Harrison Road.

Dennistoun Amateur Photographic Association. "Photographic Economy." C. Rochead.

Thursday, January 9.

Brighouse Photographic Society. "Blue Print Process." H. P. Metcalfe.

Huddersfield Naturalist and Photographic Society. Exhibition of "Photography and Focus" Prize Slides.

Hammersmith (Hampshire House) Photographic Society. "Camera Records from the Zoological Gardens." D. Seth-Smith, F.Z.S.

Rodley and District Photographic Society. Members' Night.

Liverpool Amateur Photographic Association. Slides of R.P.S. and Lancashire Photographic Union.

Friday, January 10.

Dennistoun Amateur Photographic Association. "Enlarging." R. Wallace.

THE PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

A meeting of the Council was held on Friday, December 13. Present:—Messrs. M. Adams, Gordon Chase, A. Corbett, W. E. Gray, R. Haines, A. Mackie, Lang Sims, H. A. St. George, and F. G. Wakefield.

The hon. secretary referred to his efforts in finding out how the association could assist members to secure early release from Army service.

A letter was read from a member asking for advice in reference to an agreement with a pupil not to open business or take a situation with a photographer within a certain radius of his studio. The reply was that the law only allowed such restriction as was necessary to protect the business, and to what extent that restriction might be carried depended on the circumstances of the case.

The circumstances were related by the hon. secretary of an interesting inquiry involving the ownership of the copyright in a photograph taken by a photographer, at the suggestion of a friend, who had paid for the copies supplied him; there being, however, no contract or implied contract with regard to the actual taking of the photograph, the general opinion of the Council was that the photographer could not sustain his right to the copyright.

A member remarked that the advertised price of hypo, although it had fallen, was still in excess of what the wholesale price justified.

The greater part of the evening was occupied in discussing certain propositions for the better carrying out of the objects of the association brought forward by Mr. Marcus Adams, and a committee was appointed to consider the same and report to the Council.

Commercial & Legal Intelligence.

NEW COMPANIES.

Tearne and Sons, Ltd.—This private company was registered on December 20 with a capital of £5,000, in £1 shares. Objects: Transfer, colour and general printers, photographers, etc. The subscribers (each with one share) are: A. George, New Rose and Crown Inn, Rubery, licensed victualler; F. E. Tearne, 22, All Saints Road, Birmingham, transfer manufacturer; A. J. L. Menzies, 22, All Saints Road, Birmingham, transfer manufacturer. First directors: A. George, F. E. Tearne, and A. J. L. Menzies. Registered office 22, All Saints Road, Birmingham.

News and Notes.

British Science Products at Manchester.—The exhibition now being held at the College of Technology shows the advances made in the application of science to British industry during the war. It is not confined to munitions entirely, but includes many branches which formerly were considered to be almost monopolies of Germany. Photographers will be interested principally in the lenses made for aeroplane work, which will prove useful in many other fields. Messrs. Aldis show two twenty-inch triplet lenses of very large aperture, one of which is pierced by shrapnel in action, but is still quite usable. Messrs. Taylor, Taylor, and Hobson, Ltd., show their "Aviar" lenses, and some very fine enlargements (24 x 18) from negatives made from the air with one of these lenses of 8¼ in. focal length and aperture f/4.5. They claim that this lens is now considered superior to those made by Zeiss. Messrs. Dallmeyer also show their lenses for aerial photography and other work. Messrs. Adam Hilger show their light-filters in "flats," and both this firm and Messrs. Rheinberg show some wonderful "graticules," which are extremely fine scales produced on glass for measuring purposes in connection with microscopy and similar scientific work, as well as for artillery field-glasses. These are engraved on the surface of the glass by various photographic and semi-photographic processes. Messrs. Hilger exhibit the Abbé Refractometer and other instruments for the advanced research worker.

British Baryta-coated paper, produced by Messrs. Alex. Pirie and Sons, Ltd., of Bucksburn, Aberdeenshire, is exhibited in the form of photographic prints of all sizes, mostly bromide and gaslight, of various well-known makers (Paget, Kosmos, Barnet), as well as some fine large prints by the ferro prussiate and true to scale processes.

Chemicals for photographic use are shown by A. Boake, Roberts and Co., Ltd., Stratford, E. (sulphites), James Burrough, Ltd., Lambeth, S.E.11 (Absolute alcohol, which was not made in this country previous to the war), Hopkin and Williams, Ltd., Hatton Garden (chemical reagents for research, replacing Kahlbaums), Johnson and Sons, Finsbury, E.C.2 (developers).

The United Alkali Co., Ltd., of Liverpool, show a varnish which they call "Duroprene." This should prove of great interest to photographers and apparatus makers on account of its extraordinary resistance to both acids and alkalies, as well as to atmospheric fumes of all kinds. It has been in use by the firm on metal, wood, and stone work exposed to the fumes of their own works, but has only just been placed on the market. This product is also being tentatively made in the form of translucent and tinted sheets. The resistant qualities of this varnish are shown by pieces of copper, etc., coated with it and immersed in various acids and alkalies (including ammonia) of 20 per cent. strength, as well as in petrol and alcohol. It is sold on the basis of 14s. for one gallon.

In optical glass, the well-known firm of Chance, Bros., Smethwick, near Birmingham, show some large pieces, which compel expressions of admiration from the least technical-minded observer for their clearness and purity of substance. A disc for an astronomical telescope was shown, of the large diameter of 23 inches. The making of one like this usually takes over a year. Magnesium ribbon and aluminium powder are shown by several firms. Arc lamps are shown by the Westminster Engineering Co.

Correspondence.

**** Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

**** We do not undertake responsibility for the opinions expressed by our correspondents.*

THE ASSISTANT QUESTION.

To the Editors.

Gentlemen,—Judging by the correspondence in recent issues of the "B.J.," there appears to be a growing interest in this very urgent and vital question.

Will every master and assistant who is in any way interested in the advancement of this matter of training of the assistant address to me a postcard to the Camera Club, 17, John Street, Adelphi, Strand, W.C.2? If sufficient evidence is forthcoming indicating that there is an earnest desire on the part of the persons concerned for this greater efficiency, it will spirit us with confidence further to develop the details of a scheme which has been under serious consideration for some time past. I would ask correspondents to express their ideas freely and frankly. The desire is to put into effect a scheme that will afford everyone an equal chance to gain by effort the skill needed by all assistants in the future.

This being so, opinions are required. So I hope your readers will not hesitate and think someone else will do all that's needed. It is their opportunity. Let them send a word, and thus help those who would help them. Awaiting their support, Yours sincerely,

Marcus Adams.

THE PROBLEM OF HALATION.

To the Editors.

Gentlemen,—Your "Ex Cathedra" remarks on halation are interesting and instructive, but we are still a long way from knowing all there is to know about halation and its prevention. The point that puzzles me, and possibly others is why some careful workers get halated negatives, while others do not, even when working on the same subject and under similar conditions. One must, I think, come to the conclusion that development is to a very, very large extent responsible for halated negatives.

An annual event at our local photographic society is a developing competition, and it has fallen to my lot each year to expose two or three dozen unbacked plates on the same subject, giving exactly the same exposure to each plate. A plate is given to each competitor to develop, he not knowing the subject, make of plate, or whether the plate was under, over, or accurately timed. The results obtained have been extraordinary in variety, particularly as regards halation—some showing it badly, others not at all.

For the last competition I selected a different subject, having the question of halation in mind. As two or three dozen plates have to be exposed under precisely the same conditions, landscapes or portraits are out of the question, and I always arrange a still life piece indoors and expose by meter. The subject in question consisted of two eggs in white egg-cups arranged against a clock in a dark oak case. The problem was, of course, to render the grain of the oak in the clock case without losing the delicate light and shade upon the eggs; and I also thought that the rapid appearance of the eggs on the negative would lead some competitors astray, especially if they watched the progress of development in a dish.

The results were most varied and interesting; the majority of the negatives showed the eggs very badly halated, while a few of the plates showed not the slightest trace of it. Why?

I asked the producer of the best negative how he developed, and his reply was: "I developed in the ordinary way; simply put it in a tank with some diluted developer, took the temperature, and timed it most carefully, and never saw the plate until it was ready for fixing." Older and more expert competitors made a terrible hash of their plates, though some of them worked with a tank and by time, as the winner did. I say this because enthusiastic tank users may be led to quote the instance given in order to support their views on tank development; but taken as a whole—and putting

aside the best negative—dish-developed negatives were as good as those tanked.

The facts given above, with others I have, lead me to believe that halation depends as much upon development as upon backing and make of plate, and I hope some enthusiastic and unbiassed worker will solve the problem.—Yours faithfully, L. T. W.

Answers to Correspondents.

SPECIAL NOTICE.

In consequence of general reduced supplies of paper, as the result of prohibition of the importation of much wood pulp and grass, a smaller space will be available until further notice for replies to correspondents.

Moreover, we will answer by post if stamped and addressed envelope is enclosed or reply: 5-cent. International Coupon, from readers abroad.

The full questions and answers will be printed only in the case of inquiries of general interest.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

L. W.—Such materials were formerly obtainable from Mr. W. J. Barnes, Draper, 68, Upper Street, Islington, London, N., but we do not know whether, after four years of war time conditions, he has any to sell.

H. R.—The initials on your lens denote "Photographic Artists' Co-operative Supply Association." The True View lenses were rather indifferent rapid rectilinears with a full aperture of *f*/8. The 10 x 8 size was listed at £5 5s. in 1882.

J. C.—We are sorry we cannot give you any information from the data you supply. The numbers are only consecutive ones, and do not express a type. In any case, the lenses must be about sixty years old, and only worth a few shillings each.

W. M.—We think you will do well to retain the ground-glass, for, apart from equalising the light, the prints are usually of better quality. We think that if you place the arc further from the condenser you will get more even illumination. This adjustment should be made after focussing the image.

J. W.—The best suggestion we can make for caulking the joints of the box is marine glue, which you can obtain from a drysalter or, if not, from such a firm as Messrs. A. W. Penrose and Co., 109, Farringdon Road, E.C.1, but we think your best course would have been to have made the makers put the tank in proper condition.

T E.—It would be very difficult to get a first-class man to give you the instruction you require, and in any case two weeks would be far too short a time, as you would require continuous instruction for that time. Your best plan would be to attend the Polytechnic *day* school at 309, Regent Street, London, W.1, where you can get expert teaching in the branches you mention.

W. G.—The cheapest method is to procure a changing-bag in which you can change your plates by touch; this is quite satisfactory if you are moderately careful. Do not trust to one that is fitted with eye-pieces or a slit to look through. The "Shepherd," sold by Houghtons at a pre-war price of 10s. 6d., is a very good one. It has eye-pieces, but they are easily blocked up. Practise a bit at home with old negatives. The Mackenzie-Wishart system is excellent. The slide costs 21s. in half-plate size and the envelopes 2s. each (pre-war prices). Messrs. Mackenzie and Co., 212, Old Dumbarton Road, Glasgow, will send full particulars on application.

J. C.—The lens is quite suitable, but must be stopped down to *f*/11 at the least to obtain sufficient depth of field; even then you will probably have to use the swing back to get the two rows into focus at once. With this aperture, using Johnson's flash powder, you will require about a small heaped-up teaspoonful as a minimum, assuming that the walls of the room are fairly light, and that you use an Imperial flashlight plate, or one of similar speed; with dark walls and a slower plate, you may use up to double the quantity of powder. The powder should be spread out in a train on a flat piece of tin, which should be nailed on the top of a stick so that it can be held up to about 7 or 8 ft. high. This should be held about level with the camera, and about six feet to one side of it. You can use the touch paper supplied with the flash powder according to the directions given with it. As soon as the paper is lighted uncap the lens; it may take about 30 to 60 seconds before the flash goes off. Caution your sitters not to look up at the light, or they will have "blind eyes" in the picture. Use freshly mixed flash powder. It loses its actinic quality after a week or two. Remember that the powder is far more explosive than ordinary gunpowder, so do not leave the lid off the tin when the flash is to be fired.

STUDIO.—In my studio the light is on the north side, and is 7 ft. 10 in. square, beginning 3 ft. 5 ins. from the floor. I have done some very good things in it, but at the same time I want a little more light on the opposite side sometimes. Do you think that it would improve matters if I had a light put in the opposite side, which would be due south, and to control it with blinds? Or would it be better to put in a battery of half-watt lamps, not so much to take by night, but to assist the daylight when it is failing? In which case which system is best? To have the roof whitened and have 1,000-candle-power lamps with the light reflected up to the roof, and so get it soft, or to have the lamps put in in a half-circle and have them in a linen bob, each lamp being controlled by a separate switch?—J. B.

Either of the plans you suggest should answer very well. If you do not want to work at night, probably the south window would be cheaper and quite satisfactory. We do not much care for mixed day and artificial light if it can be avoided. If you have the half-watts, we should shut out the daylight altogether, and in that case we should arrange the lamps in a curve with linen or calico diffusers. You might have one reflected light from the roof, or you could have the lamps in open-top boxes so that you had both reflected and diffused light from the same lamp.

The British Journal of Photography.

IMPORTANT NOTICE.—Advertisers are requested to notice that the prices printed below represent an

Increased Scale of Charges,

which is now in operation in respect to all line announcements.

Since advertisements cannot be inserted until fully and correctly prepaid, senders of line announcements are asked to bear in mind this revised tariff. They will thus save themselves delay in the publication of their announcements.

Net Prepaid Line Advertisements.
Increased Tariff of Charges.

12 words or less	1/-
Extra words	1d. per word.

(No reduction for a series.)

Special Note. Adv'ts under a Box Number.

"Box No." and office address	charged as 6 words.
For forwarding replies add ...	6d. per insertion for each adv't.

If replies are called for this latter charge is not made.

Advertisements cannot be inserted until fully and correctly prepaid.

Orders to repeat an adv't must be accompanied by the advertisement as previously printed.

Advertisements are not accepted over the telephone.

The latest time for receiving small line advertisements is 12 o'clock (noon) on Wednesdays for the current week's issue.

Displayed Adv'ts should reach the Publishers Monday morning.

The insertion of an Advertisement in any definite issue cannot be guaranteed.

HENRY GREENWOOD & CO., Ltd., Publishers,
24, Wellington Street, Strand, LONDON, W.C.2.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3062. Vol. LXVI. FRIDAY, JANUARY 10, 1919. Price Twopence.

Contents.

	Page
Ex Cathedra	9
Buying Equipment	10
Practices in the Studio. By Practicus	11
Photographic Materials and Processes. By B. V. Sturt, M.Sc.	13
Assistants' Notes	15
Forthcoming Exhibitions	15
Exhibitions	16
Patent News	16
New Books	16
Meetings of Societies	16
Commercial and Legal Intelligence	17
News and Notes	17
Correspondence— The Assistant Question—Aero-Photography and Town Planning—The All-round Man—Soda or Potash	18
Answers to Correspondents	19

The Summary of contents which usually occupies the lower half of this column will be found at the foot of the page overleaf and will continue to be placed there whilst its regular position is required for notices relating to the forthcoming "B.J. Almanac."

No More.

It must be announced that the whole edition of the British Journal Almanac for 1919 is now ordered, and no further copies can be supplied. The books of our publishers show that many dealers who have ordinarily supplied considerable numbers of the Almanac have this year so far not placed their orders. They, together with all the dealers throughout the country, have been simultaneously circularised by our publishers' sales department, and, therefore, the responsibility rests with them. Unfortunately, in the circumstances of restricted edition imposed by the scarcity of paper, the principle of "first come, first served" has necessarily had to be adopted.

Therefore, our advice to any reader of these lines who has not yet ordered a copy of the Almanac is that he should ascertain from his dealer whether a copy will be available; should the answer, in view of the fact stated in the previous paragraph, be in the negative, then the only remaining suggestion which it is possible for us to make is that the would-be purchaser should make application for a copy to some large dealer in London or the provinces who may perchance be able to supply him.

As regards the date of publication, we have endeavoured to arrange for the Almanacs to be available to the trade throughout the United Kingdom at the end of January or during the first few days of February. It is just as well to say that we still hope to publish about this time, although the production of the printed sheets of the Almanac has been delayed a considerable number of days beyond the scheduled time. Therefore, it is possible that readers will require to wait for some days beyond the time already announced. Let us say that it is with a good deal of regret that we have had to submit to these variations, and uncertainties in the publication of the Almanac. In the years before the war its appearance to the day was a thing upon which our publishers prided themselves not a little. It may be hoped that with the 1920 edition they can resume their habit of punctuality.

EX CATHEDRA.

Enlargements for Finishing. Labour is often wasted in working up enlargements because the enlarged print is too flat and soft to begin with; a print which might be a perfect reproduction of the tones of the original being often quite unsuitable for finishing, especially as it becomes difficult to preserve the likeness. If we start with a flat print we have to put in both light and shadow, and this not only calls for a much higher degree of skill but necessitates spending four or five times the amount of time which would be necessary with a more "contrasty" image. The following account of an experiment in this direction may be of some assistance to those who produce their own enlargements throughout. The original was a flat carbon bromide print of a three-quarter length figure from a negative about three inches by two and a 12 by 10 enlargement finished in black and white was required. A same-sized negative was made from this in the usual way using an ordinary plate, and as good an enlargement as was possible to obtain made from it. This proved to be full of detail, but was too even in tone all over to give an effective result. A second enlargement was made, giving a shorter exposure but this, while preserving what high lights were present in the original, was far too grey in the shadows. Another negative was made using a process plate which was developed as fully as possible, showing a decided improvement upon the ordinary plate. This was intensified with iodide of mercury, followed by amidol, and quite a brilliant image obtained. When enlarged the grain of the original was more evident than in the first result, but there was plenty of light and shade. Working up was done with black lead powder and pumice, the lights being taken out with a pointed rubber, and the final touches given with a black chalk pencil. The finished result was soft yet full of modelling, and such as might have been obtained from a good studio negative. Although in this case the work was done twice over, there was really no more trouble involved in making the successful enlargement than in the failure had the right plan been adopted at once. For the benefit of those who are not accustomed to using process plates it may be stated that these are quite suitable for ordinary copying, and that contrast is much more readily obtained while they are much more amenable to intensification than are ordinary or extra rapid plates

* * *

The Best from Under-Exposure. We are inclined to think that many operators, when developing plates that are known to have been grossly under-exposed through circumstances over which the photographer has no control, give too little time to the operation. Of course, if the negatives are required for press work the method which we describe below is not practicable on account of the long time taken. But in other circum-

stances, when a few hours do not greatly matter, we can recommend a trial of it. We do not claim, of course, that the procedure is a new one; but as the result of our own experience it is of very considerable value, and either entirely unknown or overlooked by the majority of photographers. Recently we exposed two plates of the non-screen ortho variety upon the same subject at exactly the same time, giving both the same exposure, which by a meter was only about a fifth what it should have been to secure the minimum correct exposure. These two plates were developed side by side in the same dish, using the time method, and the ordinary pyro-soda formula. When development had apparently come to a standstill one plate was taken out and fixed, while the other was left in the solution after dilution with about six times its own bulk of water. The dish was covered with a sheet of card and put aside for about an hour and a-half. The negative was then placed in a dish of plain water covered as before, and left until the next morning, when it was fixed and washed. Those two negatives, when examined side by side, amply justified the procedure. The first plate was weak, lacking in both tonal quality and shadow detail; while the second, though slightly pyro-stained, was of quite good printing quality, nor was there any tendency towards "grain," which would certainly have been the case if development had been unduly forced.

* * *

Sketch Portraits. One of the things that the sketch photographer needs to be careful about is the manner in which the sitter is placed on the plate. Recently we saw an instance of this in the head and shoulders portrait of an army officer. The camera was evidently much too high, and the resulting picture gave the impression that one was looking down upon the sitter's head, while at the same time, due to an uncomfortable pose, the sitter was falling forward, as it were, into the picture. Whether that particular picture satisfied the sitter we do not know, but it should not have satisfied the photographer. Many photographers, when posing their sitters for a sketch portrait, pay little or no attention to the general attitude of the body. Yet if this is neglected it is next to impossible to obtain a satisfactory poise of the head. The arms frequently cause trouble in this way, and if care is not taken give a humpy or round-shouldered appearance to the sitter. The showcases of many photographers furnish abundant evidence of the fact that the trunk of the sitter's body was not posed in a comfortable position or even a natural one; though only a head and shoulders portrait is to be taken, it is impossible to obtain the best results if attention to these minor details is not given.

* * *

Strip Tests in Carbon Printing. One of the greatest difficulties encountered by the beginner in carbon printing is the correct estimation of exposure. The experienced printer can tell at a glance how many "tints" a certain negative will require, but a novice is quite at sea and spoils much tissue in arriving at even a passable result. To such we recommend the adoption of the strip-testing system as practised in bromide printing, and, as it is not practicable to hold the shading card while the actinometer is working, a little mechanical device becomes necessary. This is made by cutting three pieces of opaque card the width of the inside of the opening of the printing-frame, one piece being a quarter the length of the plate, one half the length, and the third three-quarters of the length. For example, if the front of the frame has a clear opening of six inches by four we shall require one piece four by one and a half, one four by three, and one four by four and a half. If we take a fairly strong negative we may give the whole of it one tint, then drop on the narrow strip and give another tint, then the halfway strip and the three-quarter strip, giving a tint after adding each. We shall then get a print one end of which has had one tint while the other has had four tints, two and three intervening. Developing should be done in rather cool water, not over 80 degrees, and we shall then see which exposure is most suitable for the negative. If this test be applied to half a dozen negatives differing as widely as possible we shall get a set of typical densities with their correct exposures. Of course, many negatives will print with less than one tint, and in this case it would be perhaps better to adopt one of the "step" actinometers. In any case, all that is necessary is to establish a definite relation between the actinometer tint and the density of the negative. This does not make any allowance for the varying rapidity of the tissue, but it is assumed that the printer will not overlook this point.

BUYING EQUIPMENT.

STARTING a photographic business resembles in many respects setting up housekeeping; that is to say, there is a natural tendency to spend an undue proportion of the sum allotted for the purpose on certain big items and to stint on less showy but more essential details—in other

SUMMARY.

The second annual report of the Society of Chemical Industry, dealing with progress in photographic manufacture during 1917, forms an excellent guide to the subject. (P. 13.)

Errors which are likely to be committed when purchasing the appliances and fittings for a new photographic business are dealt with in an article on page 10.

At the Royal Photographic Society, on Tuesday evening last, a demonstration was given of a new photographic material, Kerotype paper, providing very wide facilities for the making of prints on any description of paper, and on other materials, such as wood, metal, silk or satin. The paper is developed in the first instance exactly like a bromide or a gaslight paper. (P. 16.)

The camera and lens, with critical remarks upon the various fittings and suggestions for securing the most practical outfits, form the matter of an article by "Practicus" on page 11.

Some practical hints on "strip printing," including the securing of uniform exposures and conveniences in developing, are given on page 15.

A letter from an assistant on the education question, and others on aero-photography and town planning, the all-round man, and the substitution of soda salts for those of potash find a place under "Correspondence. (P. 18.)

An account of yet another exhibition of war photographs, which was opened at the Grafton Galleries on Tuesday last, is given on page 16.

The usefulness of carrying a small repair outfit, on that of the cyclists' model, when engaged in outdoor work, is demonstrated on page 15.

A note on a new booklet on the use of Wratten M-filters will be found on page 18.

The quality of an enlargement greatly influences the amount of work necessary to produce a well finished effect. A note on this point, with practical suggestions, will be found on page 9.

How to obtain the best result from a plate which has received insufficient exposure is the subject of a note on page 9.

The applicability of the "strip test" system, to enable beginners in carbon printing to obtain correct exposure, is pointed out on page 10.

Mending vulcanite articles, waterproof linings for sinks and dishes, developing materials, and the extra-sensitising of plates are among the subjects dealt with in "Answers to Correspondents." (P. 17.)

words, to purchase suites and decorations for the reception and perhaps the bedrooms, and to neglect the kitchen and scullery. In the photographer's case this has its equivalent in buying a large and elaborate camera outfit, a quantity of furniture and backgrounds, and making shift with inferior appliances in the dark and printing-rooms.

An experienced chemist once said that when equipping a laboratory it could be assumed that after finding the cost of the principal pieces of apparatus, which the inexperienced imagined represented the bulk of the outlay, an equal amount should be allowed for sundries, which need not be purchased all at once but as required. We recently found confirmation of this judgment in the remark which a beginner in portraiture made in reply to a question as to how the business was progressing. It was to the effect that the takings were quite satisfactory, but that he had not received much benefit, as there was always something else to buy.

If a little more judgment had been exercised in the first outlay there would have been a surplus available, and the profits of the first few months would not have been swallowed up as quickly as they were made. In our friend's case success came quickly, and he could live and still get what was needed; but very often it takes some months before running expenses are covered and anything that can be called a profit made.

There is always a temptation to go in for a big studio camera. A twelve by ten with lenses to suit is usually the minimum, but the old hand knows that this size is now rarely required for direct portrait work in most studios. We can, therefore, economise by getting a good whole-plate outfit and keep something in hand for the outdoor apparatus, which should be of the larger size. Any panel portraits or studio groups can be quite well taken with a good field camera and lens, and in other cases large prints can easily be made by enlarging. We are apt to forget that developing papers are now almost exclusively used, and that if only a moderate size is required there is no need to mention the fact that the prints are not made by contact. This brings us to the question of enlarging apparatus. Wherever it is possible this should be installed from the first, as it will soon save its cost, and it is preferable to select the lantern form instead of a daylight apparatus—however, the latter is better than nothing, and even a fixed focus box giving an enlargement of two diameters will be found of great value, as it enables a cabinet negative to be enlarged to twelve by ten almost as easily as the making of a contact print. As an example of the value and practicability of enlarging we may mention an order for a number of full-sized reproductions of pen-and-ink designs. These were photographed upon half-plates, and enlarged to fifteen by twelve. The difference in the price of the small and large plates made a very substantial increase in the profit on the job, and the customer was not a penny the worse.

Great economy can be effected by properly equipping the dark-room, especially now that so much bromide work is done. Plenty of sink accommodation should be provided, and if lead be found too costly asphalt sheeting can be used as lining. It should be remembered that bench room can always be obtained by covering a sink with boards, but it is impossible to reverse the process. An efficient lamp with red and yellow filters is needed, and it is a good plan to provide a second one for the general illumination of the room; this will prevent many breakages. A good printing box taking negatives up to whole-plate is almost a necessity nowadays even in the smallest business, for the little man who has to do every stroke himself must not have to waste time with printing frames. An ample number of dishes for developing, fixing, and washing should be provided, the larger ones being of wood lined with some waterproof material, and the smaller ones of porcelain. Vulcanite and celluloid are best avoided for professional work.

We may now return to the studio, and consider the question of backgrounds. Where it is possible one end wall should be finished so as to serve as an interior; in addition, we require a very dark and a white ground with continuous floorcloth. When funds permit a piece of bold-patterned tapestry may be added, but scenic backgrounds are not needed except for the cheapest class of work. Chairs and tables should be, as a rule, light and dainty, such as people use every day, and not specially designed for photographic use. A heavy oak chair is a useful accessory when it is necessary to take the mayor or other celebrity.

In the work-room especial care should be taken to facilitate output. It never should be necessary to clear the apparatus necessary for one operation before another can be started. There should be places for attaching tissue, trimming, and mounting, and these spaces should never be encroached upon.

Retouching desks should be ample in size and firmly made. Anyone with the least mechanical ability can make a good desk in an hour or two, always bearing in mind that the desk is made for the use of a human being and not for a negative. It is absurd to talk about quarter-plate and half-plate desks when they are supposed to accommodate a well-grown man or woman.

It is necessary to decide what to buy before entering the dealer's portals, or it is likely that a lot of unnecessary stuff will be obtained. The purchaser should know better than the salesman what he requires, and it is only natural for the latter to try and shift such goods as are rather slow in selling. We shall not harm the dealer by this advice; his bill will come to the same, but if the tyro makes his own choice he should get what he really needs.

PRACTICUS IN THE STUDIO.

THE CAMERA AND LENS.

The selection of the studio camera and lens, or rather lenses, for it is a serious handicap to have to work with one only, deserves the most careful consideration, and in comparison with other items a liberal allotment should be made when planning your outlay. A badly made camera or an inferior lens will soon cause the loss of more money than is saved on their cost, and will do much to brand the work turned out as second class or worse. The operator should never work with the feeling that he could do better if he had better apparatus. Now I do not want to convey the idea that such apparatus should necessarily be costly, and as an instance of this I may say that I recently selected for a young friend a 12 x 10 outfit, comprising camera, studio stand, a 12 in. *f*/4 portrait lens, and a 5 D. Dallmeyer *f*/6, at a total cost of less than £25, all being purchased from well-known London dealers.

Broadly speaking, there are two models of studio camera: the British pattern, as made by Hare, Watson, and several other makers, and the German model, which has been extensively copied by English makers. For practical purposes there is little to choose between them. When choosing a camera

it is desirable to have one which is not permanently built into its stand, as in the case of any accident to the latter the whole outfit is rendered useless; besides this, it is impossible to get the camera near the floor, which is often necessary when taking children's portraits.

Movements essential to the studio camera are rack and pinion or screw focussing. Personally I prefer the latter, although it is considered rather out of date now, as it never gives trouble by becoming loose and allowing the back to move, besides being conveniently placed in a fixed position. There should be vertical and side wings to the back and a rising front; the bellows should be of ample length, bearing in mind that lenses of much greater focal length are now used than was formerly the case. Twenty-four inches is not an uncommon length, so that for a 4½-in. head on a 12 x 10 plate we require an extension of 36 ins. This should not be lost sight of, if one is offered an otherwise suitable camera of old pattern, although the defect may be remedied by fitting a cone extension or "box front." Whatever camera is selected it should be well cared for and not allowed to become covered with the black greasy patches one too often sees. In passing I may remark that ordinary spirits of turpentine is an excellent medium for cleaning dirty woodwork, and an hour's work with it, followed by some good furniture cream, will often make a camera and stand look worth 50 per cent. more than when you started.

It is very usual to fix repeating backs so that two half- or quarter-plates can be used side by side. This is a survival of wet plate days, when it was no more trouble to coat and sensitise a whole-plate than one-half or quarter the size. I think that the American plan of "one slide, one exposure" much more handy and safe. Many of the American studio stands have racks on either side, one for unexposed and the other for exposed, a dozen or more cheap single slides each for a 7 x 5 (American half-plate) being supplied with the camera. Double exposures can then only be made by the grossest carelessness. Another "Yankee notion" which is a good one is to make the pushing of the slide into the exposing position open the shutter. This has been improved upon by Messrs. Dallmeyer, who introduced a back in which double flap exposing shutter slipped along with the slide, so that the lens did not require covering before the slide was opened; this saves much time. In my opinion, any camera-maker who would supply such a device fitted with a number of *cheap* slides would find his reward. Think of the convenience of being able to make a couple of dozen exposures without having to refill.

If the ordinary stands do not seem satisfactory to you, the platform style, of which the Hana and the Semi-Centennial are the best known examples, will probably meet all requirements. In these a platform carrying the camera travels between two uprights, and the camera may be placed as high as an ordinary person can see to focus at or lowered to a few inches from the floor, the castors should be rubber-shod, and, if possible, a brake fitted, so that there is no risk of moving the camera when inserting the slide. The lens shutter is an important feature in studio apparatus, and the rubber fittings thereof have probably conduced to more profanity than all the rest of the outfit. I like the feel of a ball and tube while it is in good condition, but that is usually only for a brief period, before it begins playing tricks before an important sitter. The Bowden wire cable or "Antinous" release is much more reliable, and would be better if the bicycle cable were used instead of the weaker form usually fitted. The pressure button, too, is particularly annoying, as one cannot grab it anyhow as one can the rubber bulb, but must get hold of it just right between the fingers. It would be quite easy to make a pear-shaped handle to work like the rubber one, and if the makers want a sketch for it I will send them one, but that will probably not be till the patent has expired.

Now for the shutter itself, after having relieved my feelings about releases. The best shutter I have ever used, and I think I have worked with nearly every pattern, is an American one, the Packard Ideal. There are several shutters, none British, of this pattern, which are probably nearly if not quite as good. It is made on the sector principle, with vulcanite leaves, and the working parts are balanced, so that very little pressure is required to actuate it. Let me confess it works best with a rubber ball and tube, the only disadvantage of which is that the rubber is too hard and the ball splits; still, if you substitute a good English bulb this trouble vanishes. The next best shutter is the velvet flap, originally introduced by Mr. James Cadett, and still in use in the majority of studios under the name of the Guerry shutter. Why an English shutter had to be made in France and sold under a French name I cannot say, but so it is. The hemispherical bellows, or Gründner's shutter, is fairly satisfactory, but the interior bellows is troublesome. With the Antinous release it is much better, although the leather bellows which forms the shutter is easily injured by a careless operator; still, on the whole, it is a good shutter.

No less important than the camera is the lens; in fact, although with a faulty camera and a good lens we may produce excellent results, it is impossible to reverse the conditions and do so with a faulty lens upon the finest camera. The requirements of different studios vary so greatly that it is difficult to suggest the most suitable all-round selection. The length of the studio is an important factor, and I feel that I cannot do better than to refer the reader to the table dealing with the subject in the B.J. Almanac. Next in importance is the type of lens. Of late years there has been a growing tendency to oust the time-honoured Petzval or Dallmeyer types in favour of the rapid anastigmats. There are two sides to the question, and these have been little discussed. The anastigmat is unquestionably far superior to the portrait lens, when tried to its fullest extent, but it loses this position when only a small portion of its field is being utilised, as its cost is much greater and its qualities are wasted. If I were selecting lenses for a short studio, say, an eight-inch for cabinets and a twelve-inch for whole-plate standing figures, my choice would be an $f/4.5$ anastigmat of the desired focus, but if I could use a fourteen or sixteen-inch lens for cabinets I think that I should go for a portrait lens, which I could get at much less cost and which would possibly be fitted with a "diffusion of focus" adjustment. One point which I would specially impress upon the purchaser is to choose as long focus a lens as his studio will accommodate for the greater part of the work to be done. If the studio be very short, so that a 6½ or 7-inch lens has to be used for full-length cabinets, it is better to obtain at least a ten-inch lens for heads and half-lengths and to get a smaller lens for the full lengths. There are now some very cheap anastigmats which work well, with apertures of $f/6$ to $f/7.7$, to be purchased at prices which were formerly charged for common foreign rectilinears, and these will answer for short-focus portrait work.

There is a growing demand for soft definition in portraiture. By this I do not mean absolute fuzziness such as some selecting committees used to revel in, but a general softening of outline and suppression of small detail without loss of texture. To secure this many lenses have been introduced, and I have made negatives with most of them. The majority give too great an amount of diffusion at full aperture, and when stopped down to reduce this the exposures are unduly prolonged. For the everyday professional who wishes to make an essay in this direction I would suggest the use of the "patent" portrait lens of Dallmeyer, the recent portrait lenses of Ross, and the Cooke portrait lens. All these have adjustments which allow of any degree of diffusion up to a certain point being introduced at will, while in the case of the Ross and Dallmeyer lens a

further stage may be attained by removing the back combination and using the front lens *per se* and *in situ*. There are many nameless portrait lenses, very bad as a whole, which would make excellent soft focus lenses if the back combination were taken out and lost. It should be remembered that the front lens of a portrait lens usually requires only slightly more than double the exposure of the complete lens, and not four times, as is the case with a rectilinear. The focussing eye-piece or magnifier is a very useful little adjunct to the camera outfit, as it saves eye strain and makes for certainty in focussing, especially in copying. One of fairly good quality of the Ramsden pattern will be found most satisfactory, as the field is flat and the definition good. The cheap forms with single lenses have too much spherical and chromatic aberration to be used by anyone not skilled in optical observation, and those who are would not give them house room. PRACTICUS.

PHOTOGRAPHIC MATERIALS AND PROCESSES.

[We are glad of the opportunity of publishing the second of the annual reports on progress in photographic manufacture which has been issued by the Society of Chemical Industry. The author is again Mr. B. V. Storr, M.Sc., of the Ilford Company, to whom students of the technical and scientific side of photography will feel indebted for his analysis of what has been published and accomplished during the period under review, that is to say, the year 1917. We should point out that the reference "J" which figures frequently in the footnotes is to the "Journal of the Society of Chemical Industry." It will, of course, be noted that the report is one which had been completed some considerable time ago. Apparently it is not possible for the Society to bring these reviews out closer to date, although we should have thought that less than a year might be allowed to elapse before the completion of the reviewed period and the publication of the report.—EDS. "B. J."]

APART from work on the production and perfecting of a satisfactory colour cinematograph process, it is probable that the chief photographic effort in the past eighteen months has been towards the improvement of methods particularly adapted to problems of the war. Exactly what has been accomplished in this direction is not yet disclosed to the general public, although some indications have been given in the form of special photographs such as those shown at the last exhibition of the Royal Photographic Society.

On the whole the general manufacturing conditions have been getting gradually more and more difficult, although in some directions there has been an easement. Bromides, which reached a maximum price of about 25s. per lb. in 1916, have settled down again to about 5s. per lb., while silver, which reached a record price of just over 4s. 6d. per oz. troy, has dropped again to somewhat nearer its normal price. Gold chloride, on the other hand, has increased in price by about 25 per cent. Gelatine and all kinds of paper have been getting steadily scarcer and dearer, and owing to their own particular circumstances the manufacturers have found difficulty in maintaining their former standard. The condition of the glass market has compelled manufacturers to make use of renovated negative glass. The general effect of the entry of the United States into the war is not yet fully evident, but it appears highly probable that supplies of some of the raw materials will be still more restricted.

The general position on some smaller though essential points has improved greatly. In addition to metol substitutes, metol itself is now being produced in this country as well as p-aminophenol, which latter is also being made in Canada; in Australia[1] the manufacture of pyrogallic acid and amidol has been undertaken by a department of the government. The position in enemy countries is not known with certainty, but the patented process of Pape[2] to resuscitate old developers by the addition of alkali is suggestive. Schering[3] improves baryta-coated papers by a further coating of albumen, and Lappe-Cramer[4] makes the suggestion to improve packing papers by impregnation with manganese dioxide.

The production of sensitising dyes to replace those in general use before the war has been successfully accomplished by W. J. Pope,[5] under whose direction are now being made, for Ilford, Limited, sensitol red and green (German pinacyanol and pinaverdol) and a new sensitiser, sensitol violet, in addition to erythrosin and a number of dyes used for making photographic light-filters. These are being used both in this country and in the United States.[6]

Negative Processes.

There is little of actual progress to record in negative processes. The attempt to increase the effective speed of X-ray plates is being made in several directions, but no serious advance can as yet be reported. Baker[7] increases X-ray speed by the use of two intensifying screens, one in front of the film, very transparent to X-rays, and one behind the film less transparent; Edwards[8] for the same purpose proposes to coat celluloid film on both sides with emulsion. Paris and Picard[9] have extended their patent with respect to phosphorescent substances to include the use of phosphorescent zinc sulphide as a substratum screen, a film of gelatinous alumina being precipitated on the sulphide to prevent contact with the sensitive coating.

La Rougery[10] has patented the production of a special negative paper by high-temperature calendering and pressure and Hudson[11] the process of using an ordinary white paper or card for negative purposes, prints being obtained by reflected light. Sosna and Hiedebach[12] have extended their list of dyes used to prevent dark-room fog, etc., to include phenolphthalein, which turns red in alkaline developers—a process very similar in principle to the old method of using a dye in the developer.

Several of the processes of manipulation have received considerable attention. Crabtree,[13] of the Kodak Research Laboratory, has a paper on development at high temperatures such as are frequent in tropical countries. The chief hardening agents are formalin, alum, and chrome alum, which may be employed before, during, or after development; the method recommended is to use a p-aminophenol developer, which causes very little swelling of the gelatine, followed by a plain fixing bath, a chrome-alum fixing bath, or a formalin fixing bath according to the temperature. In the experiments 95°F. (35°C.) was taken as the maximum which need be considered. An interesting method of using a two-solution developer is given by North,[14] who treats the plate first with the solution of reducer and then with the alkali, a method which has the effect under suitable conditions of restraining the denser parts of the image and allowing full development of the light tones. p-Phenylenediamine or quinol with ammonium chloride[15] is recommended as developer when fineness of grain is desired, the slight solvent action of these substances on the silver salt assisting in this direction; Koch and du Prél,[16] however, attribute the effect to a development of part only of the silver bromide granule. Brewster[17] patents the use of the same developer, combined with nitrate, for development of a wide range of exposures; both substances were, of course, known already as preventives of reversal when present in the film during exposure.

[1] *Board of Trade J.*, Aug. 31, 1916; *J.*, 1916, 944.
[2] Ger. Pat. 290539, 1916. *J.*, 1917, 324.
[3] Ger. Pat. 290502, 1913; *J.*, 1917, 306.
[4] *Phot. Ind.*, 1916, Heft 43; *Z. angew. Chem.*, 1917, Ref. 29; *J.*, 1917, 306.
[5] *J.*, 1917, 162.
[6] *Phot. J. Amer.*, 1917, 419-422.

[7] Eng. Pat. 17092, 1915; *J.*, 1917, 163.
[8] Eng. Pat. 111913, 1916; *J.*, 1918, 75A.
[9] Addition to Fr. Pat. 477173; *J.*, 1916, 1131.
[10] Eng. Pat. 108193, 1916; *J.*, 1917, 1029.
[11] Eng. Pat. 14511, 1915; *J.*, 1916, 1236.
[12] Ger. Pat. 285723, 1915; *J.*, 1916, 1083.
[13] Communication No. 62 from Eastman Kodak Research Laboratory, *B. J.*, 1917, 555-559; *J.*, 1919, 21A.
[14] *Photography*, 1917, 3-4.
[15] Lumière and Seyewetz, *Phot. Korr.* *Phot. J. Amer.*, 1916, 406.
[16] *Phys. Zeits.*, 1916, 536-540. *Sci. Abs.*, 1917, 68.
[17] Eng. Pat. 9331, 1915; *J.*, 1916, 907.

Ross,[18] for the production of stellar images, recommends the use of a quinol and alkali hydroxide developer as giving clean-cut images, a practice in agreement with that of process workers. In this connection some experiments of Campbell[19] and Turner[20] are interesting. The former, by measurements of spectrograms, obtained smaller readings for the separation of pairs of lines than were given by Rowland's tables. The latter got a similar effect in crossed images of a reseau when the lines approached within a certain limiting distance and suggests some mutual effect between the images; it would be interesting to know to what extent this effect could be explained by a disturbance of the mass centres of slightly separated images by reason of the overlapping of the fringes between them, and also whether an actual slight displacement of the lines towards one another is produced in the drying of the plates by reason of the hardening of the film between the lines as compared with that on either side.

Hochstetter[21] has patented a combined developing and fixing bath which contains thiosulphate and glycerine, with citrate apparently as restrainer.

The general question of fixing and washing has been examined by Elsden[22] and Warwick.[23] The former determined the rate of removal of thiosulphate from a gelatine film by successive washings and found no evidence of adsorption. The actual time necessary for complete removal will of course depend upon the amount of thiosulphate present, but chiefly upon the rate at which equilibrium is attained between the film and the washing water, this being a function of the nature of the gelatine film and temperature. Warwick found the same general rule to apply and examined also the behaviour of papers, where the absorbent base complicates the problem, and the method of washing in running water. In a further paper Warwick[24] considers the rate of removal of the silver salt by thiosulphate, the normal law being again followed. The rate is dependent on the strength of the hypo solution, a maximum being reached at about 40 per cent. and a zero rate at saturation point. He used a silver sulphide tint method for estimating the quantity of silver. His general conclusion as to the correctness of the advice usually given to fix for twice as long as is required to "clear" the film is combated by the Editor of the "Photographic Journal of America,"[25] who found that thorough washing completely removed all the silver from plates taken from the fixing bath immediately all turbidity had disappeared.

Weinhandler and Simpson[26] patent a method of destroying thiosulphate and salts of weak sulphur acids by means of hypochlorite produced by the electrolysis of sodium chloride solution containing prints or negatives.

Bainbridge[27] recommends the permanganate test as the most delicate for thiosulphate, an indication being given by degradation of tint even at a dilution of 1 in 15,000,000; the mercurous nitrate test is more affected by common impurities and indicates only up to 1 in 2,000,000.

A considerable amount of discussion has centred round the properties of various reducing solutions, a desideratum being a reducer having an effect proportional to the depth of image. Huse and Nietz,[28] following up a suggestion of Deck,[29] examined the effect of combined permanganate and persulphate, and also that of hypochlorite,[30] both reducers being nearly proportional. Becher and Winterstein[31] have examined the action of iodine both alone and combined with thiourea and with cyanide; they give also a general classification of the best known reducers. Greenall[32] examined mixtures of thiosulphate and persulphate, which are much steadier in action than persulphate alone. Gear[33] calls attention to the preserving action of potassium bromide, manna, and glucose on ferricyanide solutions. Smith[34] recommends ammonio-copper sulphate in place of ferricyanide now that the latter is so expensive.

A paper by Crabtree[35] describes the variation of flash powders with their composition, both as to the metal and the oxidiser used, with the fineness of division of the metal and with the arrangement when fired. A mixture containing sodium oxalate, red phosphorus, a metallic powder such as magnesium or a mixture of magnesium and aluminium, and a substance such as strontium nitrate, is patented[36] by him for the Eastman Kodak Co.

Wedekind[37] has patented the use of metals such as zirconium, thorium, and titanium, mixed with their nitrates or chlorates for the production of smokeless and odourless flash-powders.

Crowther[38] has examined the chemical reactions involved in the chromium intensification process first suggested by Eder and afterwards modified and expanded by Piper and Carnegie in 1905. With Eder's original formula in which a higher proportion of acid is used than in any of the modifications suggested and which leads to only slight intensification, there does not appear to be any chromium compound attached to the bleached image. In the case of the other three formulæ given by Piper and Carnegie, where the intensification obtained increases as the proportion of acid is reduced, the amount of attached chromium also increases; in the extreme case this appears to be partly chromium hydroxide and partly chromium trioxide, the latter imparting a brown colour, and in the other cases only the hydroxide.

Positive Processes.

The supply of platinum is still too limited for it to be available for photographic purposes. General Thayer[39] is said to have discovered a considerable source of it in the Adirondacks, but that has not yet materialised. The Platinotype Company have introduced "Palladiotype" in which palladium is used to give effects very similar to those of platinum, and the use of palladium as a toning agent for collodion paper facilitated by a bath which contains ammonium chloride, sodium glycollate, and succinic acid and does not require a special fixing bath, has been recommended by Valenta.[40] The latter has also investigated the properties of salts of diglycollatoferric acid[41] from which an excellent blue printing paper can be obtained, but of poor keeping qualities. Valenta[42] also draws attention to the fact that Sulzberger's patent on the use of ferrocyanide (mentioned in the last report) was forestalled by Fox Talbot in 1839 and that the process was mentioned in Eder's Handbuch.

Strasser[43] has worked out a toning method with the use of Schlippe's salt; Schering[44] has improved his original selenium toning bath. Nietz and Huse[45] have worked out in some detail the possibilities of obtaining sepia tones by the use of strongly restrained developers. Very few papers give good tones by this process; the best results are obtained by a chloro-quinol developer containing bromide and metabisulphite and necessitating an increase of exposure of from 75 to 100 times that required by normal developers.

Spitzer and Wilhelm[46] have patented a combined toning and fixing bath containing tellurous or telluric acid or their salts along with thiosulphate.

Two patents for transfer processes have been brought out, one by Pin[47] for film in which coconut oil soap is the chief stripping agent, and one by Kent and Middleton[48] for paper, using paraffin wax. A transferotype bromide paper on similar lines has been introduced by the Kodak Co.

In process and allied work, Bull, Smith, and Turner[49] have a paper on some of the intricacies of the half-tone process, Fishenden[50]

[18] Communication No. 47 from Eastman Kodak Research Laboratory. *B. J.*, 1917, 629.
[19] Lick Observ. Bull. [No. 284], 1916, 28-29. *Sci. Abs.*, 1917, 19.
[20] Roy. Astronom. Soc., M. N. 77, 1917, 519-521. *Sci. Abs.*, 1917, 396.
[21] U.S. Pat. 1207142, 1916; *J.*, 1917, 163.
[22] *Phot. J.*, 1917, 90-94; *J.*, 1917, 354.
[23] From *American Photography*. *B. J.*, 1917, 261-4; *J.*, 1917, 669.
[24] From *American Photography*, 1917. *B. J.*, 1917, 617-620; *J.*, 1918, 39A.
[25] *Phot. J. Amer.*, 1917, 171-172.
[26] U.S. Pat. 1224984, 1917; *J.*, 1917, 669.
[27] *Photography*, 1917, 81.
[28] *J. Franklin Inst.*, 1916, 532-533. *B. J.*, 1916, 580-582; *J.*, 1916, 1180.
[29] *B. J.*, 1916, 391-392.
[30] *B. J.*, 1917, 143.
[31] *Z. wiss. Phot.*, 1917, 1-16; *J.*, 1918, 40A.
[32] *Photography*, 1917, 205.
[33] *Phot. J.*, 1916, 184.
[34] *B. J.*, 1916, 574.
[35] *B. J.*, 1917, 29-32.
[36] U.S. Pat. 1240027, 1917; *J.*, 1917, 1149.
[37] Ger. Pat. 293998, 1914; *J.*, 1916, 1180.
[38] *J.*, 1916, 817.
[39] *Phot. J. Amer.*, 1917, 487.
[40] From *Phot. Korr.* *B. J.*, 1917, 80.
[41] From *Phot. Korr.* *B. J.*, 1917, 70.
[42] From *Phot Korr.* *B. J.*, 1917, 81; Ann. Rep., 1, 302.
[43] *Phot. Rundsch.*, 1916, 33-35. *Chem. Zeit.*, 1916, Rep. 304; *J.*, 1916, 1035.
[44] Ger. Pat. 296009, 1914; *J.*, 1917, 615.
[45] Communication No. 53 from Eastman Kodak Research Laboratory; *B. J.*, 1917, 497-499; *J.*, 1918, 21A
[46] Ger. Pat. 292352, 1914; *J.*, 1916, 1083.
[47] U.S. Pat. 1184772, 1916; *J.*, 1916, 755.
[48] Eng. Pat. 12891, 1915; *J.*, 1916, 1035.
[49] *Phot. J.*, 1917, 8-14; *J.*, 1917, 353.
[50] *B. J.*, 1916, 431-433.

on the photographic engraving of rollers for intaglio printing, and Crabtree[22] on the advantage of using citric and oxalic acids respectively in the preparation of zinc and aluminium plates for lithographs. Dorian[23] has patented the use of a half-tone screen composed of small lenticular grains, preferably coloured (see also Knudson; Ann. Rep. 1, 303). Rieder[24] obtains an intaglio printing surface by forming a screen surface in bichromated fish glue and getting a positive over that in caoutchouc and asphalt; Orans,[25] for ease of correction, prints on emulsion coated on a serrated surface of the type of a Levy screen on celluloid or celluloid on glass.

Meadway[26] uses a mixture of naphthalene and a white metal, with rubber as adhesive, as coating for a projection screen, while Bebbington[27] coats a support such as glass, gelatine, or waxed paper with a dull blue-coloured solution and projects on to that side, the audience facing the other side.

An interesting account is given by Warburg[28] of the work of Meisling on the use of dyes such as erythrosine and auramine as hardening agents in the carbon and gum processes, an effect which is attributed to the formation of formalin. The erythrosin preparations are said to be quite equal to those containing bichromate and to have better keeping qualities. B. V. Sloan, M.Sc.

(To be continued.)

STRIP PRINTING.

(From Rajar "Trade Notes.")

The method of printing bromides in strips either "three on" or "six on" is, to judge by our ever increasing sales, becoming more popular than ever both for postcards and larger work. This month we propose to offer a friendly criticism of some of the methods of working that have come under our observation.

The chief trouble seems to be in getting all the images the same depth, and we think that in most cases it is not the assistant who is to blame, but the method. The exposing light may be so powerful that the exposure necessary is only a fraction of a second, and it becomes an easy matter to make a 50 per cent. or even a 100 per cent. error. The light should be screened down or a lower candle-power light used, so that at least two or three seconds exposure is required; the extra time so occupied would be saved by the absence of "repeats," and better all-round work would result. In counting seconds it is better to count quickly—one-two-three-four, one; one-two-three-four, two; and so on. A loud-ticking clock will serve as an accurate guide.

Another defect often met with is the incorrect placing of a vignetted head on postcard strips, with the result that upon trimming the head is on one side of the card. To prevent this, it is a good plan to get a waste postcard, exactly 5½ by 3½, and cut out an oval opening about 3½ by 2¼ in the centre, or a little higher. When adjusting the negative in the carrier the cut-out postcard is placed on it, taking care to see that the card is in the correct first "feed" mark.

Another trouble is "air bells" in development or fixing. The chances of getting these in development can be reduced to a minimum by placing the strips in the developer in pairs, back to back. We have seen many skilful assistants work this way, using the right hand to pair them and the left hand to place them in the developer and turn them over. Up to a dozen pairs can be handled in this way, taking care to keep them in the order in which they go into the developer, and to use plenty of solution. With the finger and thumb it is an easy matter to pick out the bottom pair, place it at the top, and so on, removing the pairs one by one as they become fully developed. When thrown in the fixing bath an assistant should at once part the pairs and fully immerse them, afterwards keeping them on the move. It is true that perfect fixation is more important than thorough washing, and it is equally true that the first minute of a print's immersion in the fixing bath is the most important, and the fixing solution should have free access to both back and front of the print.

[22] Communication No. 66 from Eastman Kodak Research Laboratory, *J. Franklin Inst.*, 1917, 635-636; *J.*, 1917, 664.
[23] Eng. Pat. 7560, 1916; *B. J.*, 1918, 110.
[24] Eng. Pat. 6257, 1914; *J.*, 1918, 7[illegible].
[25] Eng. Pat. 10869, 1914; *J.*, 1918, 7[illegible].
[26] U.S. Pat. 1234154, 1917; *J.*, 1917, 602.
[27] Eng. Pat. 104711, 1916; *B. J.*, 1917, 6[illegible].
[28] *Amato-Photographen*, Jan., 1917; *B. J.*, 1917, 96; *J.*, 1917, 351.

Assistants' Notes.

Notes by assistants suitable for this column will be considered and paid for on the first of the month following publication.

A Camera Repair-Outfit.

Only one photographer have I ever met who habitually carried a repair-outfit when going on outdoor jobs, and his practice consisted principally in twelve-by-ten and whole-plate work at a distance from his headquarters. It is an idea that is well worth following, because, although the occasion for its use may never arise at all when out on a job, there is always the possibility of an accident when the means of a make-shift repair may save the job. In addition to this, there are cases when the movements of the camera are strained to their limits to include an extremely high building, or for other reasons that will occur to all outdoor operators. On such occasions as these a little slackening or even temporary removal of a few screws will prevent that strain and permit of a little extra extension of the movement.

There is no reason why the repair outfit should be larger than those supplied for cycles. A small screwdriver, as sold for watchmakers, sewing-machines, or fretwork will be the largest item, then a small drill bit or bradawl fixed in a handle, obtainable at any fretwork shop, and a tiny half-round file will complete the list of tools. A small screw-eye or two are often handy in several ways and take the place of a gimlet. A small assortment of screws, steel pins or needles, a small tube of fish-glue, and a bit of strong thread or "flex," can all be packed in a little tin, and will cope with almost any emergency.—Charles.

The Tyro's First Camera.

It is a curious fact that most people who obtain a camera (either by purchase or as a gift) soon begin to wish for some other kind. Now, every girl or boy who takes up photography as a living ought to have a camera. No one gets the real enthusiasm for the work that will get him on if he is satisfied with printing from other folks' negatives.

The best all-round camera to start with for pretty well every possible reason is a quarter-plate stand-camera with a double extension, an ordinary R.R. lens, and a simple shutter, preferably a roller-blind. In addition to being the right sort of camera to learn most things from in a practical way it has several other strong advantages. One is that the necessary focussing and other operations preliminary to exposing the plate foster a care for ensuring that all this trouble will not be wasted by wrong exposure and careless afterwork. A magazine camera has exactly the opposite effect. Thus, from the very start with the stand camera one gets a bigger and far more encouraging proportion of successes.

Next, the tyro is sure, contrary to the oft-repeated text-book advice, to try his hand at portraiture, and the ability to focus properly is essential for this work. One more reason for the choice recommended, and a very strong one indeed, is that at the second-hand dealers' this particular type of camera is least in demand, and a bargain can often be secured, so that the initial outlay need not be great. The buying of the second camera, when the beginner's inclinations begin to indicate the most suitable type of instrument, will therefore be not such a costly matter, and the original quarter-plate camera will be found useful for many years afterwards, for lantern-slide making, or to form part of a copying or enlarging installation.—Kingston.

FORTHCOMING EXHIBITIONS.

February 20 to 22.—Leicester and Leicestershire Photographic Society. Secretary, H. C. Cross, 80, Harrow Road, Leicester.

February 22 to March 8.—Edinburgh Photographic Society. Entries close February 13. Secretary, George Massie, 10, Hart Street, Edinburgh.

Barnet Plates and Papers.—Messrs. Elliott and Sons, Barnet, Herts, send us a most artistic showcard, small in size but choice in character, calling attention to their plates and papers. The card is also a calendar for the present year, and we have no doubt that any dealer who has not received one will be glad to have a copy as a decorative item in his establishment.

Exhibitions.

CANADIAN OFFICIAL WAR PHOTOGRAPHS.

An exhibition—it may be supposed the last—of war photographs was opened on Tuesday last at the Grafton Galleries, Old Bond Street, London, W., by Sir Edward Kemp, the Canadian Overseas Minister. It comprises, within about 130 photographic enlargements, scenes and incidents of the several months of strenuous fighting prior to the signing of the armistice. The photographs present a tragic picture of the ruin which marked the territory within which the Canadians fought in their last advance from Amiens to Cambrai, from thence to Mons. Cambrai itself, as shown by the photograph, is a scene of awful desolation, the culmination of the ruin with which the Germans compassed it by fire before the Canadians entered it. A similar photograph shows the same fate of the old town of Valenciennes, the photographer having succeeded in photographing the conflagration itself. Other photographs depict the lighter side of warfare. What is described as "the largest photograph in the world" is a band of picture measuring, we are told, 200 ft. long and about 1 yard in width. It runs as a frieze round the whole of the gallery, and represents guns captured from the enemy. A word remains to be said for the excellent photographic quality and colouring of the enlargements, which, so we learn from the catalogue, are the work of Messrs. Raines, of Ealing. The exhibition is open to the public on weekdays from 10 a.m. to 6 p.m., and on Sundays from 3 p.m. to 6 p.m.

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Applications, December 9-21.

SHUTTERS.—No. 20,900. Photographic Shutters. S. G. and W. H. Arkell.

PLATES.—No. 20,580. Photographic Plates and Negatives. G. E. H. Rawlins.

FILM.—No. 20,951. Roll Photographic Film. W. G. Fisk.

CINEMATOGRAPHY.—No. 21,296. Cinematograph Apparatus. A. Garbarini, G. Gautier, and L. Mauclaire.

LENSES.—No. 21,200. Means for Adjusting and Indicating Focus of Camera Lenses. J. F. Mongiardino.

DARK-ROOM LAMPS.—No. 21,234. Dark-room Lamps. B. L. Oldfield and J. and R. Oldfield.

COMPLETE SPECIFICATIONS ACCEPTED.

These specifications are obtainable, price 6d. each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

COLOUR CINEMATOGRAPHY. No. 117,854 (Oct. 19, 1917).—The invention relates to the making of a film in which images of different colours alternate, the alternate tints being produced by masking one set whilst dyeing the other. The full details contained in the specification were published in "Colour Photography" Supplement of January 3 last.—Leon Forrest Douglass, 603, Petahuna Avenue, San Rafael, County Marcia, California.

DECIMAL v. OCTAVAL COINAGE.—In these days of reconstruction the advocates of reform in our coinage and weights and measures are very busy, and in particular the features of the decimal system are the subjects of profuse propaganda. It is, therefore, interesting to receive from our old friend Mr. Alfred Watkins, of Hereford, a pamphlet, in which he not merely urges a case against decimals but pleads for the adoption of an octaval system of subdivision as fitting the wants of those who make, grow, buy, or sell things. Those interested in the question may obtain a copy of the booklet, price 3d., post free, from the Watkins Meter Company, Hereford, or may order it from any bookseller.

New Books.

THE CHEMIST AND DRUGGIST DIARY, 1919.—Our good friends the "Chemist and Druggist" have again given their diary the special form of a highly classified index to the many specialties, mostly proprietary articles, which are sold by druggists. In addition to this feature and to the diary proper, it contains a *résumé* of the regulations affecting the drug trade which have come into force during the course of the war. These literary pages include also particulars up to date of the regulation for the sale of poisons, a war-time formulary, together with other information.

WONDERS OF THE SEA-SHORE.—A volume of nature photography, just issued by Messrs. T. C. and E. C. Jack, price 3s. 6d. nett, consists of 100 reproductions of photographs by Mr. F. Martin Duncan of animals and plants of the sea-shore. Each photograph is supplemented by a few words of description sufficient to explain the habits or functions of the subject of the photograph. A book of this kind is certain to find many interested students among lovers of marine life, to whom the excellent quality of Mr. Martin Duncan's photographs will immediately commend itself.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

SUNDAY, JANUARY 12.

United Stereoscopic Society. "Demonstration on Enlarging." J. J. W. Carruthers.

MONDAY, JANUARY 13.

Bradford Photographic Society. Print night: Exhibition of Yorkshire Photographic Union Prints and Members' Prints.
Dewsbury Photographic Society. Y.P.U. Members' Lantern Slides.

TUESDAY, JANUARY 14.

Royal Photographic Society. "An Estimate of the Work Done by Hurter and Driffield." J. W. Gordon, K.C.
Halifax Scientific Society (Photographic Section). "Intensification and Reduction without Chemicals." C. Thomas.
Hackney Photographic Society. "Control in Bromoil." G. B. Clifton.
Manchester Amateur Photographic Society. Monthly meeting. "The Life-History of the Wye Salmon." J. A. Hutton.

WEDNESDAY, JANUARY 15.

Croydon Camera Club. "More Travellers' Samples." F. Ackroyd.
Ilford Photographic Society. "The Old Roman Wall." Rev. J. H. Mitchell, M.A.
Hull Photographic Society. "Flanders and the Low Countries." J. V. Saunders, M.A.
Dennistoun Amateur Photographic Association. "Colour Photography." F. Burns.

THURSDAY, JANUARY 16.

Brighouse Photographic Society. Whist Drive.
Hammersmith (Hampshire House) Photographic Society. "A Chat on Silver and Silver Salts." F. W. J. Krohn.
Rodley and District Photographic Society. "Bromoil." Mr. Gundill.
Liverpool Amateur Photographic Association. Annual Meeting and Election of Officers.
Chelsea Photographic Society. Lantern Lecture. H. H. Wrench.

ROYAL PHOTOGRAPHIC SOCIETY.

MEETING held Tuesday, January 7, Mr. G. B. Clifton in the chair.

A demonstration by Messrs. F. W. Kent and T. P. Middleton of a new photographic printing material was given by Mr. Middleton. The material, just being introduced upon the market, is known as Kerotype paper, and consists of photographic paper base waxed by impregnation with paraffin wax, then coated with a special substratum (which is the subject of a patent), and then with bromide or gaslight emulsion. The paper is designed for transfer of the emulsion image to all descriptions of surface, such as paper, wood, metal, and fabrics such as silk or satin. The paper is made of three degrees of speed—namely, slow bromide for contact prints, rapid bromides for enlargements, and gaslight. Its chief recommendation to the professional or amateur photographer is that by the use of a single sensitive material prints of very great variety of tint or surface-texture can be prepared by transfer of the image to plain papers such as are available in even greater variety than those supplied ready-coated with emulsion at the present time by manufacturers. The paper is exposed and developed in exactly the ordinary way. If transferred to its new support by a single-transfer method, the image is, of course, reversed. This disability can be avoided by exposing the paper through the waxed support instead of with the emulsion coating in contact with the negative. A very slight degree of diffusion is introduced by this practice.

Mr. Middleton handed round comparison prints, the difference between which was scarcely discernible. In enlarging, of course, this necessity is dispensed with by placing the negative in the reversed position, whilst film negatives may be printed with the plain side in contact with the emulsion surface of the Kerotype paper. Even if it is preferred not to resort to these expedients, the paper can readily yield unreversed plates by a comparatively simple and easy process of double transfer.

It will thus be understood that the novelty in practice connected with the new paper lies in the operations by which it is transferred to various supports. The image on the developed prints, owing to the semi-transparent nature of the waxed paper on which the emulsion is coated is of a flat and lifeless appearance, and does not attain its full rich vigour and gradation until after transfer.

Mr. Middleton, in the course of a demonstration extending little over an hour, showed the different processes by which the paper is handled, according to the surface on which the image is to be transferred and the choice or otherwise of double transfer.

For single transfer to a plain paper supports—probably the process which will be most frequently adopted in the use of the paper—the developed, fixed, and washed print is slightly blotted off between sheets of blotting paper and then dabbed over in quite a random manner with a weak, warm solution of gelatine. The paper and print are then brought into contact by light squeegeeing, placed under pressure for a minute or two, and then hung up to dry. The waxed paper can then be stripped off, leaving the picture upon its new support.

Transfer to semi-porous bodies, such as wood, is made by coating both the print and the surface to which it is to be transferred with a little of the gelatine solution, squeegeeing the two into contact, and stripping away the back support after drying. For transfer to metal and similar surfaces which are quite impervious to liquid, the surface is coated with a gelatine solution made with the minimum quantity of water, and containing as much methylated spirit as can be added without throwing down the gelatine. The wet print is dabbed over with a plain gelatine solution, placed in contact with the metal surface, squeegeed, and again stripped after drying.

Mr Middleton likewise showed the very simple procedure for transferring the image from the dry print to fabrics, and he also demonstrated the use of a resinoid solution containing rubber, gum dammar, and gum elemi, which, as a means of carrying out certain of the transfer processes, is more convenient and rapid than the use of a gelatine solution.

Double transfer either to paper, wood, metal, or fabric is likewise very easily and quickly carried out with the aid of this resinoid solution, and though the descriptions of manipulation, when set down in cold print, appear to represent the process as involving a great deal of manipulation, it requires to be borne in mind that the demonstration showed all the variations of which the new material is capable, whereas the regular user would naturally confine himself to one or two methods only.

In reply to questions, Mr. Middleton said that the prints should be toned before transfer. He said that transfer to glass for lantern slides or enlarged negatives was not practicable, as the transferred image then disclosed a distinct grain. In reply to an inquiry as to the price of the new paper, Mr. Middleton said that it was the same as that of ordinary bromide paper. "Pre-war," asked someone. "Give us a chance," replied the lecturer, to whom an enthusiastic vote of thanks was accorded.

South London Photographic Society.—At the last meeting, Mr. W. F. Slater in the chair, Mr. F. J. Buckland, a professional photographer, delivered a lecture, illustrated with colour slides, on his experiences in Tasmania.

Official Naval Photographs.—To facilitate the purchase of copies of official naval photographs in any desired size and style, the Admiralty have arranged with the Associated Illustration Agencies that a copy of every photograph shall be available for inspection by intending purchasers, at the offices of the Associated Illustration Agencies, at St. Mary's Chambers, 161a, Strand (opposite Australia House), and the staff will take particulars of orders and conduct correspondence as to supplying copies of the photographs.

Commercial & Legal Intelligence.

NEW COMPANIES.

Robert Hayes, Ltd.—This private company was registered on December 27 with a capital of £5,000, in £1 shares, as publishers, publishers' agents, printers, press photographers, etc. The subscribers (each with one share) are:—S. A. Belasco, 61, Fleet Street, E.C., publisher; F. J. Cheringbull, 5, West Grove, Sale, Manchester, publisher; A. A. Ross, 61, Fleet Street, E.C., publisher. First directors:—S. A. Belasco, F. J. Cheringbull, and A. A. Ross. Solicitor:—J. Harle, 61, Tufnell Park Road, Holloway, N.

Boyde's Studios, Ltd.—This private company was registered on December 31 with a capital of £14,000, in £1 shares (6,000 pref.), to take over the business carried on by A. W. Little, Ada Little, and Electric Studios, Ltd., and to carry on the business of photographers, art dealers, etc. The subscribers (each with one share) are:—Miss F. Hall, 4, Upstall Street, S.E.5; S. A. Pettifer, 39, Langthorne Street, S.W.6, company secretary. First directors:—A. W. Little and H. J. G. Pessers (both permanent). Registered office:—110, Cannon Street, E.C.

News and Notes.

Royal Photographic Society.—The following have been elected Fellows of the Society:—W. Foster Brigham, Newman F. Horne, Frederick Humpherson, Lieut. J. H. Jennings, and Floyd Vail.

War Museum Photographs.—The Committee of the Imperial War Museum has taken over the Art and Photographic Sections of the Ministry of Information, and the Photographic Section will now control the official photographs, which are now on sale at 12 Coventry Street.

Rajar Social Evening.—An enjoyable evening of the staff of Messrs. Rajar, Ltd., reinforced by many of their friends, was held at Altrincham on Saturday last, when two plays were performed and a number of musical items presented to the company, after which a programme of dances brought to an end a most pleasant evening.

An Amateur Photographic Society, under the title of the D.S. and S. Camera Club, has been formed by the Liverpool branch of the National Federation of Discharged Soldiers and Sailors, which it is greatly hoped will prove very successful. It is open to all ex-soldiers and sailors, who are cordially invited. The club meets on Thursdays at 7.45 p.m. at the Liverpool branch club house, 154, Islington. All particulars can be obtained from the Hon. Secretary, 19, Wavertree Nook, Wavertree, Liverpool.

Aberdeen Photographic Association.—The sum of £20 15s., representing the total proceeds, without any deductions, of a members' whist drive held just before Christmas, has been handed over to the Aberdeen Red Cross Association by the Treasurer of the Aberdeen Photographic Association. The whist drive was organised and carried out almost entirely by the lady members of the Photographic Association. The Aberdeen Photographic Association has this year brought to Aberdeen the honour of first place in the annual lantern-slide competition held by the Scottish Federation, and also the additional honour of first place in the members' individual competition, the President (Mr. Alfred J. Wood, of Clydesdale Bank) having secured highest marks for a set of three selected slides.

The Late Mr. Frank Brunton.—We regret to record the death of Air Mechanic Frank Brunton, which occurred at his home, 4, Park Lane, Ighten Hill, Burnley, last week. Although only twenty-eight years of age, he was widely acknowledged as a sincere and gifted worker on the æsthetic side of photography, and as a member of the firm of Messrs. J. R. Brunton and Sons had done much excellent pictorial work, which was far removed from the usual run of commercial photography. Mr. Brunton joined the Royal Air Force in February, 1916, and was attached to the Kite and Balloon Section. During his Army career he had, with characteristic energy,

concentrated his attention to the work in hand, and had passed the requisite tests as an engine fitter. On engine test flights he had spent some fifty hours, covering over seventy ascents, and was reputed to possess unusual nerve and ability. At Lydd, in Kent, where he had been stationed, a wide circle of friends will mourn the loss of a dear friend. He came over on leave early in October, but was soon compelled to visit Dr. Snowball for an ulcer which developed on his eye. Complaining of feeling run down, he took to bed, and after a week passed away at noon last Saturday, the cause of death being attributed to laryngitis and heart failure.

WRATTEN M-FILTERS.—The Wratten Division of Messrs. Kodak, Ltd., have just issued a booklet, entitled "Notes on the Use of Wratten M-Filters," which takes the place of their booklet "Photo-Micrography" now out of print. The booklet is devoted to a discussion of the choice and use of the series of filters which Messrs. Wratten have designed specially for the problems of colour rendering which are encountered chiefly by the photo-micrographer. The booklet contains a useful series of data on exposure, including a table giving the multiplying factor of each filter for a series of artificial light including oil, open-arc, incandescent gas, acetylene, lime-light, and Pointolite, data for the last-named replacing the figures previously given for the Nernst lamp. In addition to the nine filters which form the M set, three others are described as likely to be of use to microscopists. No. 78 converts the light from a metal-filament lamp into daylight as regards spectral composition. It may also be used with the Pointolite lamp, and with half-watt lamps of the smaller ratings. No. 96 D 1.5 is a neutral tint filter, which passes only about 3 per cent. of the light falling on it, and is intended for use when focussing direct with a powerful light-source, or for the purpose of lengthening an exposure which is inconveniently short, as when working at a low power. The third new filter is one of blue colour which transmits no red, and is for visual use where the highest possible resolution is required. The filter is not yet on the market, but inquiries may be made respecting it under the reference No. 38a M. The booklet, which altogether is one which every photographic worker with the microscope should find of constant use, is obtainable from Messrs. Kodak, price 3d.

Correspondence.

**** Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

**** We do not undertake responsibility for the opinions expressed by our correspondents.*

THE ASSISTANT' QUESTION.

To the Editors.

Gentlemen,—The recent letters on the subject of assistants have been very interesting, and I wonder if any good effect will come of them, or will it all end in smoke? It's a very big problem, that of assistants; and not only that, but too many masters are not as efficient as they might be. They should not be allowed to take apprentices or young people carelessly, to instruct them in methods that are altogether wrong, which unfortunately they do not discover until they make a change of place. Then they discover they have been misled and badly treated. Cannot something be done? *Now* is the opportunity to reconstruct the whole method of apprenticeship and assistants. Is there not someone strong enough to launch a scheme worthy of our calling? Surely there is an assistant among us with enough pluck to start a union that will be able to assist us to obtain better positions, more money, and better working conditions. Some of the work-places are a disgrace.

We also need more sympathy from our masters. They are helpless without us; therefore, why don't they realise this, and assist us with better opportunities for learning? Some years ago there was a talk about some scheme of examination; what became of it? It's education, not examination, that matters. In fact, all of us want and would welcome some such scheme.—Yours faithfully,

AN ASSISTANT.

(At present completing three years of service.)

To the Editors.

Gentlemen,—The batch of replies to my last week's letter are very encouraging, and I thank all who have contributed their expressions of appreciation and for the many suggestions made.

I fancy there are still a few who intended sending a line but haven't. It is not too late yet!

Will all those who are interested in this matter assist by talking about it in their work-rooms, and when writing their opinions include the general feeling of their fellow-workers? I here suggest a few questions for consideration.

Do assistants feel they want more help than at present they are receiving?

Do they consider they can command higher wages, or, on the other hand, do they think they are drawing more than they ought through the fact of their not being sufficiently skilled?

Do they understand their work sufficiently, or would they like to have the details explained more fully?

Would they like to become connected with a governing body that would assist them in all matters concerning their efficiency, and thus assist in establishing greater confidence between masters and assistants?

The success of any proposed scheme largely depends upon the attitude shown by the reply letters, so if assistants are really in earnest will they please express themselves? I should like to receive at least 200 letters. We shall then feel impelled to make the effort necessary, and I shall feel more confident in laying the whole matter before the Council of the P.P.A., and it will deserve their most serious consideration.—Awaiting replies, yours sincerely,

MARCUS ADAMS.

The Camera Club, 17, John Street, Adelphi, Strand, W.C.2.
January 6.

AERO-PHOTOGRAPHY AND TOWN-PLANNING.

To the Editors.

Gentlemen,—Very little time has been allowed to elapse between the cessation of aero-mapping expeditions over enemy lines and the putting of the aeroplane and the camera it carries to peace-time work. From the mapping out of the Hindenburg and other lines, with their maze of communication trenches and barbed wire protections, to the air-mapping of rural districts for the purposes of town-planning is, in one sense, but a short step; short as it is, however, it might have taken tape-bound authorities a very long time to take, but the step has been made and the work is about to commence, if, indeed, it has not been carried out already. A builder-photographer states that the Derby Town Council is to be asked to approve an important proposal (included in the new town-planning scheme) for removing three bends in the river Derwent, laying out pleasure grounds adjoining the river, and providing land for new works adjacent thereto. The levels of the land are to be taken in order that the scheme may be properly considered, and in this connection the Air Ministry has agreed, "as a very special case," to take aerial photographs of the town-planning area. This is a new branch of work for the aero-photographers, and one in which there is an immense amount to be done. If the Derby pictures are successful, and are found to be as useful to architects and town-planners as they are expected to be, there surely can be no reason why the hundred and one other places which are to be town-planned should not be "birdseyed" in the same way. The aspect of a town from the air will in time to come be a very important matter, and now is the time to consider the question.—Yours,

AEROPHILE.

THE ALL-ROUND MAN.

To the Editors.

Gentlemen,—It really would appear time someone put in a good word for the despised A.R. man. Specialisation may be all right for one firm in a thousand where an effort is made to produce portraits

(not necessarily good) quite out of the common, for which fancy prices are charged. Men who are only capable of one particular branch of photography are also sufficient for those commercial firms who produce photographs like sausages—negatives at the studios, and retouching, printing, and enlarging at a central workshop. But why a man, instead of becoming, for instance, a retouching machine, should not endeavour to obtain a knowledge, and a thorough knowledge, of operating, printing, and enlarging, etc., as well, is beyond my comprehension.

My experience of thirty years has shown me that the majority of so-called specialists get into a groove from which nothing will move them. As an instance of the value of all-round knowledge, a lady looked the proof of her little girl taken at a first-class suburban studio. The manageress sent her to the studio for a re-sit. The operator (a new man) asked to see the proof, and found his predecessor had made an excellent negative—posing, lighting, expression were good—so he asked the lady what she disliked, to which she replied, "I like everything but the *likeness*." The modelling had been spoilt by the retoucher. Had the manageress been competent she would have asked the customer to call next day and submitted a proof with one-third of the retouching, would have pleased the customer, and avoided all the extra work and worry.

In our colonies and similar countries, outside the few large cities, the specialist would starve where the all-round man would attain affluence. The same applies to one-man studios in England. There are cases where photographers have a small business in the provinces and simply make the negatives, which they send to trade houses to be retouched and finished, but the work cannot have the individuality of work commenced and finished by a man with his heart in his work

A. R. M.

SODA OR POTASH?

To the Editors.

Gentlemen,—Sodium bromide is quite as serviceable as potassium bromide in developers and other photographic solutions, a fact that was pointed out in the pages of the "B.J." some months ago, when the potassium salt was more rare than it is to-day. Many photographers were unaware of the fact until the publication of the note, but they lost no time in trying the sodium salt and finding the truth of the statement. An American journal published in the interests of the drug, oil, and paint trade has made a "great discovery" in connection with the question of sodium versus potassium. An editorial note asks readers of the journal if they ever noticed, in reading a chemical text-book or laboratory manual, that whenever and wherever the use of an alkali is required, the choice invariably falls on potash—e.g., caustic potash? And this being the case, when you come to think of it, did you ever ask yourself why, say, caustic potash is, in the minds of the writers, professors, and "Herr Doctors," so inevitably preferable in all cases to caustic soda? Having asked this, the editor goes on to say that it never occurred to him to ask the question until it was suggested by a friend who is an official in that very-much-alive institution known as the Bureau of Standards. We are told—what some of our readers already claim to know—that the potash "stunt" was German propaganda pure and simple. Potash comes, or did until recently come, out of Germany. German writings have been followed pretty closely by writers on chemistry in all other countries, hence it became a matter of careless habit to write of potassium rather than sodium salts. Our American friend takes up a lot of his news space and uses some forcible language in order to hammer home his remarks. "German propaganda," says he, in conclusion, "pure and simple, nothing more nor less, and very clever and efficient propaganda at that. Statesmanship of the most psychologically complete character. It has caught them all, young and old, wise and foolish. Now, you professors, doctors, and learned gentlemen all, having learned from necessity that caustic soda is just as good, please revise the potassium out of your books and lectures." From the same journal we learn that there were 30,000 expert chemists in Germany at the outbreak of the war, while France had but 2,500, of which 1,400 were mobilised and 200 of them have fallen in battle. We have, however, no information concerning the casualties among German chemists.—Yours truly,

NATRIUM.

Answers to Correspondents.

SPECIAL NOTICE.

In consequence of general reduced supplies of paper, as the result of prohibition of the importation of much wood pulp and grass, a smaller space will be available until further notice for replies to correspondents.

Moreover, we will answer by post if stamped and addressed envelope is enclosed for reply: 5-cent. International Coupon, from readers abroad.

The full questions and answers will be printed only in the case of inquiries of general interest.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

J. O. J.—You can get machines for picture-frame making from Messrs. Melhuish, Fetter Lane, London, E.C.

A. F.—We would refer you to an article by "Practicus" in the "B.J." of October 26, 1917, which deals fully with the question of installing artificial light in the studio.

G. D.—A quarter-plate lens, presumably of about 5 in. focal length, is too short a focus for enlarging from a postcard negative. You want an R.R. lens of at least 6 in. focus—better 7 in.

A. J.—Any large plate-glass dealers will supply such slabs. Messrs. J. Hetley and Co., Soho Square, London, W.1, or Alfred Goslett and Co., Charing Cross Road, W.C.2, would quote you.

A. A.—With every desire to help you, we are obliged to say that we know of no method of chemical treatment which is in the least likely to improve ferrotype plates which have slowed with age.

J. A.—Tools for cutting mouldings for frames are sold by Messrs. R. Melhuish, Ltd., 50, Fetter Lane, London, E.C. There is no book on the making of picture frames from the mechanical point of view.

H. W.—It is very difficult to get any lens repairs done just now. We should think your job would be one a watch or clock maker could do. We have succeeded in getting an iris diaphragm repaired in this way, and should think a rotating one should be easy.

C. A. W.—1. We should certainly prefer the ¼-plate Sinclair "Una." 2. None better of a folding type. 3. Quite satisfactory for Autochrome work. 4. We do not understand your query; the "Una" camera has been upon the market for a number of years past, and has been successively improved.

J. C.—It is possible to correct the chromatic error in your lens, but it would probably cost much more to do so than to purchase the best lens on the market. Your best course would be to construct a scale showing the amount of racking-in necessary for various distances. Some old lenses have such a scale on the tube.

C. F. S.—The plans you suggest in queries 2 and 3 should answer your purpose best, and with rapid plates you will get the rapidity you require. No blinds are necessary, but a head screen is desirable for local control of the light. There would be much loss by using reflected light, and the lighting would be rather flat.

F. G.—The only reason we can assign is that the formula is too strong—that is to say, there is too much of the Monomet and hydroquinone for the quantity of water. You do not say what your formula is, but from the information you give it would seem that you would avoid your difficulties by taking, say, twice the quantity of water.

M. T.—So far as we know, there is no satisfactory cement for vulcanite. The best way to repair it is to cover the edges with rubber solution, and then to fasten the parts together with strips of vulcanite screwed on with brass screws. The screws must have fine threads, and the holes must be tapped. An electrician could do this for you.

F. M.—Provided the work is first-rate, an average charge is from 7s. 6d. to 10s. per negative, inclusive of one print from each. We should say that whole-plate negatives would be acceptable, although, as it is very usual for such work to be done in 12 by 10 size, you ought to have an understanding with your customer as to what the size is to be. There is no book on the photography of buildings.

A. T.—The lamp marked on the list is of ample power, but the extended form of filaments is not very suitable, and if we were you we should wait until it is possible to get one of the focus types of lamps of the General Electric Company, which we believe will shortly be again available. These are made specially for projection, and would not require the same amount of diffusion by ground glass in order to avoid filament markings on the projection screen.

A. M.—1. You will get greatly increased illumination by using the 4-in. condenser, as this will be of short focus, and you will utilise nearly all the cone of rays. 2. A 6½-in. lens will give you about the size you require. The diameter depends upon the size of your illuminant. Two inches should be sufficient. Messrs. W. Butcher and Sons list a 6-in. lens complete for 14s., pre-war price. 3. We should much prefer the Telecentric, especially for hand-camera work.

E. V.—The only book on the making of line and half-tone blocks is "Photo-Mechanical Processes," by W. T. Wilkinson, price 4s., from Messrs. Hamptons, Cursitor Street, W.C.2. At a moderate figure the price for a really good working outfit would be from £100 to £150. We ought to say that it would be quite useless your attempting to master this business without practical instruction, such as that from the L.C.C. School, Bolt Court, Fleet Street, E.C., or from Regent Street Polytechnic.

Torn Leather.—I have a changing box with leather bag of usual pattern. The latter, unfortunately, got perforated a short time ago by the sharp corner of a plate. Can you tell me the best way to repair the same?—Medico.

We know of no method of repairing a cut in leather which we would trust for such an essential matter as the flexible covering of a changing box. We should certainly advise having the leather bag replaced by new.

H. S.—We have not found any solution which will keep the joints of a wooden sink watertight. We have made a sink on the lines you suggest, and have lined it with Rubberoid without a seam. This is a black asphalt-like substance, sold in rolls, and can be obtained from builders' materials dealers. We have also used Trinidad roofing, which is very similar; both are quite satisfactory. Messrs. Kodak, Limited, make dishes on this principle. You might get one as a guide.

G. S.—Your proposed studio is very small and really too low, except for heads and sitting figures. We think that two 1,500 c.p. or three 1,000 c.p. lamps fixed as close to the ceiling as possible would be the best arrangement for it. We should fix calico diffusers below them, and also use the light reflected from the ceiling. We should advise a lens of about 10 in. focal length for work up to half-plate size. If you only wish to do heads you could use up to 14 in. focal length.

W. F. T.—We published an article a few years ago by Mr. Greenfield on the extra-sensitising of plates with dyes, but we do not for a moment think that the results of the formulæ would at all equal the Ilford panchromatic plate, which is made with dyes newly invented. We should advise you to use either these plates or to extra sensitise for yourself with dyes, which you can purchase from Messrs. Ilford. We are unable to say what is the relative gain in speed towards artificial light, but it is very considerable.

New Business.—Will you please tell me if I have to apply for permission to open a new business, or, if, owing to present circumstances, the law has lapsed?—B.

We have not heard that the regulation in regard to the opening of a new retail business has yet been relaxed, although it may not always be rigidly enforced. But we think it would be as well for you to make inquiries from the Director of National Service, at Harewood Barracks, Leeds, addressing your inquiry c.o. Assistant Director of Recruiting.

C. V.—The distances of lamps from the sitter or background cannot be given arbitrarily, as much will depend upon the lighting required. As an average, the front row should be about 8 ft. from background, the sitter being placed forward or back as more or less top light is needed. The nearest side light may be opposite the edge of background, and, say, 4 ft. away from it. The background we assume to be movable, so that you can put it aslant if necessary. The lamps may, of course, be in a curve instead of an actual right-angle or L-shape.

C. V.—1. Six 1,000 c.p. lamps are not too many if you wish for short exposures. 2. In a curve or L shape. Have the lamps to raise to 8 ft. and lower to 5 ft. 6 ins. for children or sitting figures. Use a thin head-screen to prevent over-lighting the upper part of figure. 3. A medium grey or greyish green is the best. White gives flat negatives. You can easily use a movable reflector if needed. 4. We have not heard that the Order has been relaxed, although we believe it is not always rigidly enforced. In any case you should apply to the Director of National Service, 82, Westbourne Terrace, Paddington, London, W.

O. W.—1. There is no better developer for negatives which are to be enlarged than the customary metol-hydroquinone formula, or one of the single-solution developers, the best of which is paramidophenol. Azol, of Johnson and Sons, is perhaps, the best developer of this class. 2. An acid fixing bath of any kind will corrode a metal tank. You should use the hardening fixing bath in an earthenware tank. 3. Undoubtedly pyro is the best developer for warm tones on bromide paper by direct development. 4. Yes, substantially Kachin and pyrocatechin are the same thing, though it is possible that Kachin may contain something mixed with the pyrocatechin. 5. We have no experience of the S.S. screen in Autochrome work: for use with orthochromatic plates it has no injurious effect upon the definition of the lens, and we should think it would answer as well with Autochrome plates.

The British Journal of Photography.

The Oldest Photographic Journal in the World.

PUBLISHED EVERY FRIDAY. Established 1854. **PRICE TWOPENCE**

TERMS OF SUBSCRIPTION, POST FREE.

United Kingdom.—One Year, 10s. 10d.; Six Months, 5s. 5d Three Months, 2s. 9d.

Canada	*One Year.*
Australia	Thirteen shillings (13s.), or
New Zealand	3 dollars 17 cents, or 16 francs
South Africa	38 cents, or 6 roubles 15 copecks,
United States of America	or 9 rupees 12 annas, or 6 yens
South America	30 sens.
India and Far East	
Continent of Europe ...	
Federated Malay States, Borneo and Sarawak	5 dollars 57 cents.

Henry Greenwood & Co., Ltd., Proprietors and Publishers, 24, Wellington Street, London, W.C.2.

IMPORTANT NOTICE TO READERS.—Until further notice agents will supply the "B. J." to order only, as the acceptance of "returns" by a publisher is now prohibited by the Government. It is therefore necessary in order to ensure the regular delivery of the "B. J." each week to place an order definitely with a dealer, newsagent or bookstall clerk, or to send a subscription to the publishers.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3063. Vol. LXVI. FRIDAY, JANUARY 17, 1919. Price Twopence.

21

Contents.

	Page
Ex Cathedra	21
Utilitarian Stereophotography	22
Practices in the Studio. By Practicus	23
Personal Practice in Lantern-Slide Making	25
Photographic Materials and Processes. By B. V. Stott, M.Sc.	27
Assistants' Notes	29
Meetings of Societies	30
News and Notes	30
Correspondence— Soda v. Potash Salts—Platinum—The Assistant Question—The Cult of the Modest Countenance	31
Forthcoming Exhibitions	31
Answers to Correspondents	32

The Summary of contents which usually occupies the lower half of this column will be found at the foot of the page overleaf and will continue to be placed there whilst its regular position is required for notices relating to the forthcoming "B.J. Almanac."

The First of the 15,000.

It is always something of a satisfaction to us to get the first finished copy of the Almanac. We are getting on. At any rate, the binders have a stock of all the "sheets" which make up the book, and, given a chance, will keep busy in placing them within the familiar yellow or green covers. In ordinary times we could depend on their getting out two or three thousand daily; now their daily output is measured in hundreds, and may be reduced to nothing every now and then by peremptory orders to concentrate all their staff on work of military urgency. Nevertheless, we have reasonable hopes that in the early days of next month there will be thousands enough of the 1919 Almanac to fulfil the orders throughout the United Kingdom.

The 1919 Almanac is still a volume of 644 pages. We daresay that many people will prefer it to the issues of over 1,000 pages, which in pre-war times was unique, we believe, among trade publications. Actually its text portion is almost as comprehensive as ever. To all intents and purposes the Almanac continues to be the up-to-date "enquire within upon everything" which has been its character for years past.

Smaller bulk has been conditioned chiefly by the smaller size of advertisements—in part our publishers' own restriction—but the number still provides a survey of the British photographic trade, and our readers can render a real service to this country and to friends in neutral States by sending a copy of the Almanac to tell its tale of British resources. By the withdrawal of censorship regulations the Almanac can be posted direct abroad, but to get a copy it is necessary to order at once from a dealer, as our publishers are unable to book further orders.

EX CATHEDRA.

Over-printed Self-toning Paper. With some of the more recent batches of self-toning paper we have noticed a lack of uniformity. One batch that we were using lost very considerably in the fixing-bath, with the result that printing had to be carried much deeper in order to ensure the finished print being of the requisite depth and of a good colour. A later batch, upon fixing the first print or two, showed that it was one in which the prints lost very little, and we at first thought that owing to this difference the whole of the untoned and fixed prints (a very large number) were spoiled through the printing being carried too deeply. They were, however, saved in the following way. A bath containing 4 ozs. common salt in 10 of water was made up and the prints previous to fixing were placed in this for about fifteen minutes. Upon transferring to the ordinary fixing-bath they lost a good deal of depth, being reduced to just the right quality. The tone, of course, was modified, being of a cold black, and equal in every way to platinum-toned P.O.P. In fact, it is so satisfactory that many may decide to finish all their self-toning prints in this way instead of in the ordinary sepia that is so common. We wonder that more users of self-toning paper, and especially the collodion emulsions, do not favour this method more, as it yields prints of delightful richness and quality.

* * *

Describing Second-hand Goods. Those who have at any time had occasion to study the second-hand market must have found that many advertisers, both dealers and private individuals, frequently leave much to be desired in describing the goods that are for disposal. Take the case of apparatus with which the general photographer is not very familiar or that of an older pattern not to be found listed in any of the catalogues issued within the last ten years. We recently saw advertised, "A fine half-plate camera by —— (naming a maker of a score of years ago), with two slides, no lens." This kind of advertisement, it must be admitted, gives little or no information as to the instrument for disposal, whether it is of single, double, or triple extension, whether it has a turn or tilting table, or a rising front or swing back, details that any practical worker purchasing a camera requires to have for his consideration. An older photographer might know that particular pattern even from the inadequate description given, but a modern worker certainly would not—unless he happened to have catalogues to hand of a score of years back. We have even seen lenses listed by first-class firms with a reputation for second-hand goods from which the aperture, focal length, and other important details were omitted. Advertisers of second-hand photographic

apparatus will do well to put themselves in the position of the buyer when drafting out details of their goods, giving just those full details that they themselves would wish to have; a few words should not be omitted if their inclusion would give fulness to the description. It may be that an advertisement giving full information will be seen by a buyer on the look-out for the particular model of the apparatus described, whereas he would not take the trouble to write to the vendor, if the goods were not fully detailed, for fuller particulars.

* * *

Rubber Stamps. As a rule a rubber stamp impression upon a mount gives an idea of cheapness, and quite spoils the effect of what might otherwise be an excellent production. This, like many other things, is due to a want of knowledge of the capabilities of our materials. To many people a rubber stamp is oval or circular in form, the type plain black, and the colour of ink violet, and as far as ordinary office work is concerned these conditions are doubtless satisfactory. It is, however, quite possible to employ rubber stamps in such a way that they may be impressed upon the highest class of mount without being distinguished from lithographic or typographic work. In an instance which recently came under our notice a photographer used a steel die of his signature and town for stamping his mounts or prints. From this he had electros made which were used for printing upon mounts in brown ink. Finding the need for occasionally marking odd mounts and enlargements he sent the original die to a rubber stamp maker and received a rubber facsimile with box, pad and brown ink complete. With this outfit it was possible to sign mounts without causing anything unusual in their appearance. We have also seen the well-known square label form of address, "A portrait from the studio of ——," reproduced in the same way, the result being quite satisfactory. The secret of getting good impressions is to keep the pad and stamp free from dust. An old toothbrush is excellent for keeping the stamp clean, while the pad should be scraped the right way of the material with a blunt knife. When fresh ink is applied it should be well rubbed into the pad and allowed to remain for an hour or so before using. When long narrow stamps have to be used it is a good plan to have a small brass prong projecting from one side of the plate, so as to form two little feet, on which the stamp will stand squarely. These feet also afford a good means of keeping the lettering in correct alignment with the edge of the print.

UTILITARIAN STEREOPHOTOGRAPHY.

To the great majority of people the stereoscope is nothing more than a scientific toy or perhaps a rather troublesome means of looking at a number of photographs which have cost more than usual labour to produce. In consequence the instrument has been banished from its place in the drawing-room, and only a few enthusiasts who make their own slides venture to keep it in evidence. We have from time to time urged the claim of stereoscopy to be the one branch of photography with which the draughtsman or painter cannot compete, and, further, we have pointed out the great educational value of such pictures, which are as near faithful renderings of their subjects as it is possible to obtain upon a flat surface. When produced in an additive colour process such as that of F. E. Ives, and shown on a binocular Krōmskōp the illusion is almost perfect.

For the moment we are not concerned with the beauty or scientific interest of stereoscopic work so much as with its utility in various branches of science and industry. There are many subjects full of intricate detail lying in several planes which cannot be rendered satisfactorily in a monocular photograph or by the cleverest artist. In the one case we have a plan with a certain amount of shading to represent relief and in the other we get the impression of one person who if not an expert in the subject may omit important data, while if he is an expert may unconsciously emphasize such features as seem important to him. The stereoscope is impartial in such matters, and if the separation of the view-points for the two negatives has been properly adjusted the subject should appear exactly as in nature.

It is not necessary to give a detailed list of subjects suitable for stereoscopy, for once the question is raised any intelligent person will readily perceive in what way he can apply it to further his own work or studies. Recently we were glad to hear that the medical profession has shown considerable interest in this work. Many valuable records have been obtained, but there are still many branches of science and art in which development is possible. For example, crystalline fractures such as those of cast-iron or brass, can be photographed on an enlarged scale, and by a judicious separation of the lenses any desired amount of relief can be obtained. As this question of separation has not always been clearly understood, it may be well to point out that the degree of relief obtained is governed entirely by the separation between the lenses when the exposure is made. If only

SUMMARY.

The stereoscope, which has long been displaced as an optical toy, bids fair to come into its own for scientific and technical purposes. In an article we give some suggestions for dealing with difficult subjects. (P. 22.)

A full account of Mr. Dudley Johnston's method of producing various tones on lantern slides by development only, with full formulæ and working details, is given on page 25.

The management of the sitter and his friends, with hints upon child photography, form the subject of an article by "Practicus" on page 23.

The concluding section of the report of the Society of Chemical Industry on photographic materials and processes includes many subjects, among which are various colour processes and cinematography. (P. 27.)

A curious variation in the printing depth of self-toning paper, with details of a method for saving over-printed copies without using any of the ordinary reducers, is noted on page 21.

A hint which may be helpful to those who advertise second-hand apparatus in our columns is given on page 21.

How rubber stamp impressions upon mounts and stationery may be robbed of their "cheap" appearance is pointed out on page 22.

A communication to "Assistants' Notes" draws attention to the great disparity in the wages paid by different establishments for the same classes of work, and urges upon employers the necessity of establishing a standard minimum wage for each grade. (P. 29.)

Copyright questions, the value of old lenses, flashlight for studio and other work, lens tests, and half-watt lamps are among the subjects dealt with in "Answers to Correspondents." (P. 32.)

At the Croydon Camera Club, Mr. A. Mackie lectured on early photographic history. An interesting account of the fuel value of mummies for locomotive work was added by the president. (P. 30.)

The practicability of using soda salts in place of those of potash, the supply of platinum for photographic purposes, the question of an assistants' union, and fashions in picture postcards are the subject of correspondence on page 31.

A brief account of a discourse of Mr. J. W. Gordon, K.C., on the work of Hurter and Driffield, pointing out the distinction between their practical results and theoretical conclusions, is given on page 30.

one lens be used and the exposures made successively, then the separation is the distance the lens has been moved. The distance by which the centres of prints is separated has no effect on the relief but only upon the ease with which they are combined in the stereoscope. Much of the eye strain which many people experienced is due to the separation in this respect being too great.

The error that is most likely to be made is that of using too wide a separation when working at close quarters, as when taking small objects on full or even quarter scale and in portraiture or ethnographical studies. The usual focal length of lenses supplied in pairs for stereoscopic work varies from three to six inches. Occasionally lengths up to eight inches are supplied, but this is unusual, except to special order. Even this is insufficient for close up work, as it will readily be understood that at a working distance of eighteen inches the disparity of the view-points of two lenses with a separation of three inches is very considerable, giving a drawn-out appearance to any projecting details. For example, if we desired to take a stereograph of a lump of sugar, we should obtain quite a false rendering of the crystalline texture, the small crystals being drawn out into needle-like forms. It is, therefore, often desirable to avoid the use of paired lenses, and to make the exposures by successively moving the camera the necessary distance.

It will thus be seen that for stereographs of immobile subjects, the possessor of a small camera needs no additional apparatus. All that is needed is a small board or platform on which the camera can be slidden laterally and secured at the proper point. Small devices for this purpose are listed by most of the principal dealers, and can, we believe, still be supplied. An appliance which should prove of great value to the scientific photographer is the double mirror, introduced by Mr. Theodore Brown. In this apparatus two small mirrors are hinged together like a book so that they may be placed either in one plane or at any angle to each other. When inclined together, be it ever so slightly, a dissimilar view of any object is reflected by each, and if these are photographed with an ordinary single-lens camera we have at one exposure a stereoscopic negative, no central partition or other modification of the apparatus being necessary. Although introduced mainly as a cheap and simple means of making stereo-negatives, the Brown transmitter possesses many great advantages. In the first place the limit as to the diameter of the lens is removed. Thus, rapid portrait lenses or large aperture anastigmats of any desired focal length may be used, and in the case of surgical work the simultaneous exposure minimises the risk of movement. A few experiments will be necessary to find the degree of inclination necessary for various distances, and if the mounting included a graduated arc, such as is fitted to binocular field glasses, this could be registered for future use.

There is one slight drawback to this method of working, and that is the fact that the images are laterally inverted, but for scientific work this would in many cases be of no moment; if it were the prints can be made by a transfer process such as Transferotype or the single transfer carbon process or, if films are used, by printing from the reverse side. By this method the negatives may be of much larger dimensions than is possible with a binocular camera, even as large as 15 x 12 being practicable. The prints may then be viewed in the Wheatstone or reflecting stereoscope instead of the Brewster or box-form of instrument. Stereoscopic prints, if not made in the form of transparencies, are best if printed on gelatino-chloride paper, as there is less chance of losing shadow detail than there is with developing papers. The negatives should be thin and fully exposed; what would be called flat in ordinary work where the photographer relies only upon light and shade to give a semblance of relief.

PRACTICUS IN THE STUDIO.

MANAGING THE SITTER.

The first step towards managing your sitter is to have perfect control of your own feelings; no matter what worries or annoyances you have to encounter, do not take them into the studio with you. Man is an imitative animal, and in the great majority of cases unconsciously copies the temperament of those surrounding him in a greater or less degree, according to his own strength of character. Therefore, it is very necessary that the photographer should cultivate a quiet geniality of manner, adapting his degree of freedom of speech and manner to that of his sitters, taking care to avoid an excess of familiarity with those who have an idea of their own importance or a patronising air with those of more modest manners. To put it briefly, the operator must be "all things to all men" (and women), and should bear in mind that "As iron sharpeneth iron so is a man's face brightened by the countenance of his friend."

One person at a time is quite enough to manage, and any friends who accompany the sitter must not be allowed to remain in the studio while the sitting is made. If possible they should be induced to remain in the reception-room, but usually it will not be easy to arrange this, and one at least will be allowed to enter the studio. I have always made a rule of having a screened-off corner with a comfortable chair, to which I escort the friend as soon as I have welcomed the sitter, taking care that the friend cannot peep out and be seen just as an exposure is being made. There is a good reason for this; it prevents the friend from criticising the pose, seen from a totally different position from the camera, and also prevents conversation, which often results in giggling. With children, it is, of course, necessary that they should be accompanied by an adult, but only one should be allowed. If a mother and nurse come, try to get the mother to retire behind the screen, as the child will usually behave better with the nurse, who will not try to excite it. A whole family party in the studio usually means a resitting after a lot of valuable time and plates have been wasted. Even if a family group has been taken, the members should be shown out if separate sittings of any of the children are required, and it is sometimes politic to ask permission to make a negative or two of a pretty youngster, even if not ordered. The parents feel flattered by the compliment, and go away feeling that the photographer is really a man of taste.

We now come to the practical work of making the portrait, some people call it a "picture," and we should endeavour to make it worthy of both designations. To this end it is necessary to make a rapid survey of the sitter's features and figure so as to get the best result possible. It is said that Reynolds always wanted to dine with a person before he painted his portrait, so as to get a true impression of his appearance, but the photographer is not so fortunate, for he has only a minute

or two to decide upon his course of action. I will endeavour to indicate a few of the points to be observed. There is not one person in a hundred whose features are even approximately symmetrical, so that it is necessary first to decide which side of the face is to be turned to the light. The nose will often appear quite straight if the head be turned one way, and either aquiline or retroussé if turned the other. As a rule it is advisable to choose the straight side unless other conditions militate, in which case the aid of the retoucher must be sought. With nine people out of ten the left side of the face is the most perfect, so that the studio should be arranged to take negatives with the light falling on the sitter's left hand.

The eyes are usually uneven in size and sometimes in height; the best result can be obtained by having the larger or higher eye nearest to the camera. In cases of a decided squint the abnormal eye should be turned from the camera and brought well into shade, so that it can be more easily corrected in the retouching. If the profile is fairly good, one or two positions of it should be taken when the sitter is afflicted in this way.

If the sitter's neck be short it can be made the most of by lowering the camera considerably, while with a long, scraggy neck the camera should be well raised. The height of the camera has an important effect upon the rendering of the nose. A long nose is shortened and the upper lip well shown with a low camera, while a snub nose and long upper lip is better rendered from a higher position. Tilting the head up or down will give the same effect, but this would interfere with the pose of the head and probably spoil the eyes and forehead. A small, receding forehead should be inclined towards the camera, while the possessor of a massive one may throw the head well back. In both these cases the pose will probably be a natural one to the sitter.

The hands are a constant source of worry, and many photographers now look the difficulty boldly in the face and take bust portraits almost exclusively. If they have to be included in the picture the hands should be made as unobtrusive as possible, and care should be taken not to let them come too far forward, or they will appear larger than they really are. It is usually recommended to use the swing back to bring the hands into focus without stopping down the lens, but this is not a good plan, as it necessarily renders them on a larger scale than the rest of the picture. It is always desirable to use as long focus a lens as possible for sitting figures, so as to minimise distortion of this kind. Of course, some sitters have small hands, and then there is little difficulty in dealing with them. One position is always to be avoided, that of having the fingers interlaced while the hands are lying on the knees. A book or flower may be held so as partly to hide the hands, but this device is rather hackneyed. A long chain or string of beads falling from the neck into the lap often affords an opportunity for a graceful arrangement of the fingers.

Full-length portraits are now rarely taken unless for the express purpose of displaying the dress or uniform. For these the camera should be raised, so that the lens is about level with the breast of the sitter—say, five or six inches below the chin. Care should be taken that the body is well balanced upon the feet, which should not be placed evenly, but one a little before the other; in military terms, the sitter should "stand at ease" and not at "attention." At the risk of being considered old-fashioned I strongly advocate the judicious use of the head-rest for standing figures, as not only are "moves" reduced to a minimum, but it prevents the sitter from dropping into a slouching position. I prefer not to place the rest behind the head, but behind one shoulder. The rest is also very useful when making dancing poses, as it enables a position to be held with one foot in the air. The ironwork should be painted a fairly light grey, so that it is lost in the background and is easy to work out on the negative. If black or dark green, as usually supplied, it is difficult to get rid of.

Young children present a different set of problems from adult sitters. Their features do not require so much consideration, and the lighting is usually full. The great points are to keep them still and to secure a happy expression. They should not be allowed to curl themselves up with one or both legs drawn up under them, but otherwise they will find their own poses, from which the photographer should make his choice. The great thing is to get the child's confidence as soon as it comes into the studio, and to keep the camera out of evidence as much as possible. To attempt to work with children as one would with adults is to court failure. Many of my best child pictures have been obtained by focussing upon a cushion or similar article, placed where it is intended the child to be, before it came into the studio at all; then the plate was inserted, the slide drawn, and the child coaxed into position in an innocent sort of way. Then the exposure was made, using a rather long release tube or cable, and while the child's attention was otherwise occupied the plate changed and the process repeated. A little table at which the child can stand is an excellent accessory, as if a toy be placed upon it in focus the child will usually go to it of its own accord; if spoken to it will usually look up with a pleased expression, and the exposure is instantly made. I generally find that I can get three sharp negatives out of four exposures when working this way. The "little bird" trick is not a bad one; but there should be no deception, the bird should be forthcoming. I have made hundreds of negatives with the help of a cheap toy, consisting of a small metal bird perched on a bulb which contained a water warbler, worked by a rubber tube. The bird flapped his wings and opened his beak while singing. The plan was to tell the child to look for the bird, and to give a note or two on the warbler, and immediately after the exposure to show the bird in action for a few seconds. It was then hidden and the child told that it would come back if he were good. Alas! a little sitter found it when I was not looking, and effectually ended its career. It was probably of Hun origin, and, I hope, cannot be replaced. However, the idea remains, and it might be possible to make a substitute. It is a good plan to keep a few cheap toys so that a child can take one away with it, especially if a resitting may be necessary, as the child will be willing to pay another visit to a place where toys are given away. Big toys, such as Teddy bears, horses, etc., are a nuisance, and the toy should be used to attract the child's attention and not given to it until the exposure is made. Before I learned this I have had a child march away with it into a dark corner and sit down to play with it, any attempt to entice it out being hopeless. I have said nothing about posing either adults or children, as little useful information can be conveyed by words. By the study of paintings, engravings, and the work of good photographers much can be learned and a general idea of what is graceful and artistic obtained, then when the sitter arrives one is not at a loss for a pose. If there is any characteristic mannerism about the sitter it should be preserved; if a man habitually holds his head on one side it is a mistake to put it straight, as it would be to make a man who stoops slightly stand bolt upright.

PRACTICUS.

NEW COMPANIES.

OXFORD STUDIOS (LONDON), LTD.—This private company was registered on January 3 with a capital of £1,000 in £1 shares. Objects: Photographers, photographic dealers, etc. The subscribers (each with one share) are:—F. Shaw, 1, Town Hall Parade, Brixton Hill, S.W., photographer; Mrs. M. Shaw, 1, Town Hall Parade, Brixton Hill, S.W. The first directors are F. Shaw and Mrs. M. Shaw. Registered office 1, Town Hall Parade, Brixton Hill, S.W.

PERSONAL PRACTICE IN LANTERN-SLIDE MAKING.

[Although at the time we reported fairly fully the admirable lecture delivered by Mr. Dudley Johnston before the Royal Photographic Society we cannot abstain from reprinting the more extended version which is now issued in the Society's Journal. Here appear the practical methods by which the lecturer secures the quality and nicely adjusted artistic variety in his lecture transparencies.—Eds., "B. J."]

Mr. Dudley Johnston enforced the account of his methods by the exhibition of a very large number of beautiful lantern views. He dealt in the first place with the production of slides of warm tone, and in the second with the process of blue and blue-grey tone slides, which are the characteristic feature of his own lecture sets. This latter process, he said, was not by any means easy, but there was no secret about it. It was all set out in Wratten and Wainwright's handbook (first edition) on "Lantern Slides." He believed that it had been discarded in later editions on the ground of difficulty and uncertainty, but his own experience was that it was a more certain and elastic process than the method of physical development which had been substituted. It was undeniably a somewhat difficult process, and required a long experience to work it with reasonable certainty.

He proposed to discuss the subject from the point of view of the production of a set of lantern-slides for lecture purposes. His idea, in the first place, was to consider the set as a whole, and decide upon a general colour scheme most suited to the subject. It was not necessary that the colour scheme be rigidly adhered to throughout, for that would mean a fatal monotony. But a general colour scheme, with judicious variations, formed a restful combination that was pleasing, whereas a constant succession of unrelated contrasts produced distraction. A strong or even a violent colour contrast might be used with telling effect for the climax, but any departures from the general colour selected should only be for a carefully considered contrast, and then only because the colour chosen presented the picture at least as well as the normal colour would. On the whole, a brown that was not too heavy nor yet too yellow was the most pleasant and generally useful colour.

After showing by means of the lantern how occasionally abnormal effects, such as pyro stain or double toning, could be used to serve a pictorial purpose, Mr. Johnston went on to speak of the selection of the subject. For prints a certain amount of diffusion might be desirable, especially in the unessential details of the picture, but for lantern-slide work the negatives required to be in sharp focus throughout. Development was carried through with due regard to the illuminant that was to be used to make the slides. The negatives were dried face downwards, like the slides also, to avoid catching dust or hairs, and very carefully spotted or retouched with the aid of a magnifying glass, in order to avoid as far as possible the necessity of working on the lantern-slide itself.

For making the slides he used a reducing camera made by Lizars, mounted on a baseboard about 5 feet long, with a revolving negative carrier at one end. The camera had a rising and falling front and a swing back, very useful appliances for adjusting the image and for correcting the perspective of vertical lines, etc., if necessary. The lens was a 6-inch Cooke anastigmat, working at $f/6{\cdot}5$. Usually he focussed at full aperture to get the maximum illumination of the image, and then stopped down to $f/16$ to make sure of sharpness. He used Paget slow plates almost entirely, rapid plates only occasionally for black tones. It was best to stick to one make of plate. He found no advantage in "backed" plates. His illuminant was a three-tube mercury vapour lamp, the light being reflected from a white card placed behind the negative. With this light and average negatives the exposures were:—

Black tones	7 to 10 seconds.
Brown tones	30 to 100 seconds.
Blue-grey tones	1½ to 2 minutes.
Violet tones	10 to 15 minutes.

The developer must be adjusted to the exposure. If warmer tones were desired, not only must the exposure be increased, but a corresponding alteration must be made in the constitution of the developer. Neglect of this led to muddy tones.

In development he formerly used adurol for warm tones: this, he believed, was an improved form of hydroquinone, and free from some of the latter's drawbacks. Whether adurol would be obtainable after the war was a problem; but if not, equally good results were forthcoming with a metol-hydroquinone developer, such as is given with every plate-maker's instructions. An important factor in obtaining satisfactory tones was the temperature. He worked, as a rule, at 70 degrees, and sometimes as high as 75 degrees, but great care was then required as the gelatine became very tender. His plan for keeping the developer at a constant temperature in cold weather was to keep a large basin of warm water on the bench and maintain it at 75 to 80 degrees by adding hot water as required, and in this he put all dishes and measures when not in actual use. The fixing solution and washing water should be of similar temperature to the developer.

His aim was so to adjust exposure, developer, and temperature that he got the first faint but distinct image on the plate in about 60 seconds after pouring on the developer. In that case development would be complete in above five minutes. Density was judged by looking through the slide against the lamp. (He used a yellow safelight, Wratten's O.O, with an extra sheet of yellow paper, as his lamp was 32 c.p.). It was curious to note that the developer improved with use. He did not throw it away at the end of his evening's work, but left it in the measure, and on going to work again in a day or two he threw half the old developer away and made up the bulk with fresh. Thus used, it gave better colours, was more regular in its action, and density was more easily judged.

As to blue-grey and blue tones, all of these in his slides were obtained by development pure and simple, and not by any after-toning. The blue tones obtainable by gold toning were well known, but they had not the variety and subtlety of the developed tones ranging from black through blue and violet to red. After showing by examples how this process lent itself not only to moonlight and strong effects, but also to effects of quite notable delicacy, he proceeded to give an outline of the method. The formula of the developer would be found in the first edition of Wratten and Wainwright's booklet on "Lantern Slides," and he expected it was worked out by Dr. Kenneth Mees. According to the exposure and the proportions of the developer, this would give colours ranging from black through blue to purple and red. Even for the black tones the exposure required was about four times that which was normal for an ordinary developer.

DEVELOPER.

A.—Metol	44 grains.
Water	20 ozs.
Anhydrous sodium sulphite	½ oz
Hydroquinone	22 grains.

B.—Ammonium carbonate ..... 1 oz.
Ammonium bromide ..... 1 oz.
Water ..... 10 ozs.
C.—Thiocarbamide ..... 33 grains.
Ammonium bromide ..... 11 grains.
Water ..... 10 ozs.

TABLE OF MIXTURES AND EXPOSURES.

Tone Required.	Exposure.	Developer.		
		A.	B.	C.
		dr.	dr.	dr.
Blue-black	4 times normal	6	1½	½
Blue	8 ,, ,,	5½	2	½
Violet	16 ,, ,,	5	2½	½
Red	32 ,, ,,	4½	3	½

In working this process, he aimed, as in the case of the brown tones, at an exposure which would ensure the first appearance of the image in 60 seconds, using the developer at 70 degrees. Development should then be complete in five minutes. The great difficulty was to gauge correct density, and the only reliable method was to watch the slide by reflected light in the developing dish and follow carefully the various phases. The first appearance of the image was yellowish, darkening to red, and then becoming bluish-black. As development progressed the whole slide darkened over in a manner that might suggest gross over-exposure or fogging, but this was to be disregarded. Presently the darkest portions began to take a lighter tinge, almost as if reversal was beginning. When they showed a well-pronounced buff colour development had gone far enough.

As to colour, this was mainly determined by the exposure and the composition of the developer, but the negative also seemed to have some subtle influence. Cases arose in which a negative would yield a slide of a particular colour, but no variations of exposure and development would induce it to give a really satisfactory slide of any other colour. The colour of the wet slide was usually quite different from what it would be when it was dry. Generally speaking, a slide which was a good blue when dry was pink when wet, but not invariably. This developer, again, was not at its best when fresh, and he was accustomed to put aside what remained over at the end of an evening's work, and when he next wanted to use it, poured half the developer away and added a little fresh, mixed in the same proportions as before.

Fixing took place in acid hypo, then the slide was well washed, then hardened for two minutes in 5 per cent. formalin solution, washed again for five minutes, and finally put to dry on a rack, face downwards, so as to avoid dust, etc. When dry he tested the slide in the lantern and decided whether any reduction or intensification was advisable. In his experience there were few slides that could not be improved by one or other of these processes, sometimes by both.

For reduction the slide should first be soaked in water for ten minutes or more. Hypo-ferricyanide reducer was the more generally useful form. He kept an old egg-cup into which he poured 1 dram of saturated solution of plain hypo, added two or three drops of 10 per cent. solution of potassium ferricyanide, and filled up with water. The finger tip was by far the most satisfactory means of applying the reducer, but a small sable brush was useful at times. It was wonderful how much could be done by these means with practice.

The intensification of slides was a very simple and certain process with the acid silver intensifier:—

A.—Metol ..... 88 grains.
Citric acid ..... 176 grains.
Glacial acetic acid ..... 1 oz.
Water ..... 20 ozs.
B.—Silver nitrate ..... 1 oz.
Distilled water ..... 10 ozs.

For use: 1 oz. A, 1 dram B.

This formula was well known, and was mentioned in many books on lantern-slides, but he had not anywhere seen a reference to one great and valuable property that it possessed, namely, that of intensifying the slide without altering the colour. Whether the slide were brown, black, or blue, it remained the same colour after being treated. It was necessary to apply the intensifier to the dry slide, and the action should not be continued for more than 70 or 80 seconds. If the requisite density had not been obtained in that time the slide should be washed for fifteen minutes and dried, and the intensification repeated. If the action was continued for more than 1½ minutes, or if the slide was first wetted, this intensifier tended to give a bluish tint. It was, as a matter of fact, a physical developer, and could be used to turn a very weak under-developed slide into a good blue one.

It now remained to put the finishing touches before masking and binding the finished slide. He again put the slide into the lantern and examined the projected image carefully for any defects. If there were scratches or abrasion marks, or if pieces of opaque matter or splinters of glass were embedded in the film, there was practically nothing that could be done, and if they were in the sky portion or any other place where they were noticeable it only remained to make a fresh slide. It was otherwise with clear spots, whether due to air bubbles in development or flaws in the negative, and in examining his own slides on the screen he was careful to locate any such marks.

His method of eliminating these was to place the slide on a retouching desk illuminated by a strong light reflected from a sheet of white paper, and to touch out the spots with a pencil having a very fine needle-like point. The pencils he used were 6 H. or 9 H., and the points were trimmed long and kept sharp on a pad of fine sandpaper such as Winsor and Newton made for the use of artists. A needle mounted in a paint-brush handle made an effective retouching tool, as a prick in the gelatine was sufficiently opaque. It also had the advantage of not constantly requiring to be sharpened. He went over the spot with a gentle pricking action as evenly as possible, guiding the operation with the aid of a powerful reading lens. Viewed by transmitted light the effort might appear to show little result, but when tested in the lantern—which, after all, was the conclusive test—it would probably be found much more effective than was thought.

Before binding the slide, he thoroughly dried both the paper mask and the slide before a gas fire, and took great care to exclude all hairs and particles of dust (which showed a most wonderful affection for the warm film) when attaching the cover glass.

Mr. Dudley Johnston concluded by passing a number of slides through the lantern. Most of the slides were Italian views, and they illustrated the capacity of the thiocarbamide process to give, on the one hand, full rich black tones of really velvety quality, and, on the other, red or reddish purple slides, with every effect in between, including delicate greys and blues.

At the close of his lecture Mr. Dudley Johnston was asked what was the best surface to lay the plate on in order to dry, and said he used wire racks above the mantlepiece, and simply supported the plate face downwards against the wall so that there was plenty of air underneath, and yet any dust settling would go on the back of the plate and not on the face of it. In reply to the chairman, who asked whether he fixed face downwards or upwards in the dish, he replied that he fixed face upwards.

PHOTOGRAPHIC MATERIALS AND PROCESSES.

(We are glad of the opportunity of publishing the second of the annual reports on progress in photographic manufacture which has been issued by the Society of Chemical Industry. The author is again Mr. B. V. Storr, M.Sc., of the Ilford Company, to whom students of the technical and scientific side of photography will feel indebted for his analysis of what has been published and accomplished during the period under review, that is to say, the year 1917. We should point out that the reference "J" which figures frequently in the footnotes is to the "Journal of the Society of Chemical Industry." It will, of course, be noted that the report is one which had been completed some considerable time ago. Apparently it is not possible for the Society to bring these reviews out closer to date, although we should have thought that less than a year might be allowed to elapse before the completion of the reviewed period and the publication of the report.—EDS "B. J.")

(*Continued from page* 15.)

Colour Processes and Cinematography.

Three-colour cinematograph methods have been produced in America. The Technicolor[56] process, introduced by a company formed to work the Comstock patents, is a two-colour additive method, the images being superposed on the screen. The taking apparatus is a single lens camera with a special form of grid mirror for division of the light; the projection camera includes as a registering device two refracting plates, one in each beam, and pivoted on axes at right angles. The Prizma[57] process of the Panchromotion Co., based on the patents of Wohl and Mayer and Kelly and Raleigh, uses four overlapping colour filters in the taking camera and in the projection camera has two main filters each with smaller sections of a different colour inserted—an orange-red with magenta segments and a blue-green with blue segments. The full details of the third process[58] are not to hand, but it would appear to have been brought out by the Eastman Kodak Co. It uses a two-colour single film positive, with the colours on opposite sides of the same film. The printing is done from a colour selection negative with two alternating sets of pictures, a device of lenses and prisms projecting at the same time images of two consecutive pictures one on either side of the positive, each side of which is stained to prevent action of either light on both films.

A large number of patents have been taken out for various details in connection with colour processes. One of the most interesting is that of Szczepanik and Habrich[59] for the bleach-out process, applied for in 1913; particulars are given of the dyes and sensitisers used. Gartlgruber[60] covers a stereoscopic process in which the pairs of pictures are in complementary colours. Henley[61] has a method of stereo-cinematography, using two taking cameras and two negatives from which a single positive is obtained; a special viewing apparatus is required. Wilkinson,[62] Jones,[63] Ives,[64] Hess,[65] and Fox[66] (with Kinemacolor) all use variations of very similar methods of obtaining and combining two or three colours in printing. The Brewster Film Co.[67] uses an adsorbent silver halide, formed by the action of a halogen and a halide such as iodine in potassium iodide. Christensen[68] extends his method of taking advantage of variations in the porosity of a developed film, to the use of special filling substances in the fixing bath. Thornton[69] has several patents in connection with the printing of positives, including the use of a photomechanical printing film and special devices for registering films in printing. Shorrocks[70] has a method of staining in two colours at one operation; a film with two sets of alternating pictures, one of which sets has been bleached, is passed through a bath containing a dye such as rhodamine, which stains the bleached pictures red, and ferricyanide citrate, which stains the unbleached pictures blue-green.

In the making of multicoloured screens Pierman[71] has a process of weaving coloured transparent threads, Schleussner[72] uses a single layer of particles, coalescence being produced by exposure to a solvent vapour, Kitsee[73] obtains very fine particles by spraying a solution of a colloid into a hardening or coagulating vapour, *e.g.*, gelatin into formalin, and Tarlton[74] gets a two-colour screen by a first coating in one colour of a single layer of particles, coating over this with a stained bichromate film, exposing through the back, and developing, which leaves the interstices filled with the second coating.

Walker[75] for the Hess-Ives Corporation, uses a reflecting mirror coated with a dichroic compound such as eosine; there is an appreciable gain in the total amount of available light compared with the normal reflecting mirror which cannot utilise more than 50 per cent. of the two component lights.

Miss Greene,[76] Hochstetter and Pierson[77], and Trivelli[78] have patented various methods of renovating cinema films, the two former by mechanical means, the last by means of a lacquer. Ives[79] protects the sensitive surface of the film by a varnish of gum damar, removed before development. Lovejoy,[80] for the Eastman Kodak Co., uses a composite base, the parts of which are oppositely electrified by friction, thus avoiding the dangers from this source in the handling of sensitised films. Planchat[81] dries cinema film by the pressure obtained by passing it through a column of mercury.

Theoretical and Experimental.

The subject of the nature of the latent image has been approached from several standpoints. Channon[82] gives an account of some experiments extending over a period of twenty years, showing the effect of time on the latent image; loss of density and veil are the chief effects; there was also some evidence of photo-retrogression in several of the experiments. Homolka[83] discusses the difference between ferricyanide and reducing substances such as ferrocyanide, sulphite, and phenylglycine in their effects when plates containing them are exposed to light. There is no visible action in the one case and a blackening in the others, and Homolka uses this result to support the subbromide and perbromide formation theory. (See also a further paper by Crowther[84] on the use of substituted *p*-phenylenediamines.) On the other hand Padoa and Mervini,[85] from their work on temperature coefficients, conclude that the formation of a latent image is not due to a decomposition of the order $AgCl = Ag + Cl$.

Several interesting papers on the properties of gelatine and its solutions have appeared. Moeller[86] gives an account of some experiments showing the laminated structure of jellies and supporting the theory of the fibrillated structure of gelatine. Arisz[87] has studied the viscosity of solutions of gelatine in a glycerin-water mixture, and its variation with temperature, concentration, etc. He finds permanent loss of viscosity above 65° C., due to partial hydrolysis.

---

[56] *B. J.*, 1917, *Colour Supplement*, 41-43.
[57] *B. J.*, 1917, *Colour Supplement*, 14.
[58] *B. J.*, 1917, *Colour Supplement*, 45-46.
[59] Eng. Pat. 20896, 1916; *B. J.*, 1916, *Colour Supplement*, 45-47.
[60] Eng. Pat. 104009, 1916; *B. J.*, 1917, 251.
[61] Eng. Pat. 109873, 1916; *B. J.*, 1917, 439.
[62] *B. J.*, 1916, *Colour Supplement*, 26-27.
[63] Eng. Pat. 105890, 1916; *J.*, 1917, 615.
[64] U.S. Pats. 1189040, 1916, and 1247116, 1917; *J.*, 1916, 907, and 1918, 40A.
[65] U.S. Pat. 1[illegible]66, 1917; *J.*, 1917, 660.
[66] U.S. Pat. 1207367, 1916; *J.*, 1917, 163.
[67] Eng. Pat. 100098, 1915; *B. J.*, 1917, 300 and 301. U.S. Pat. 1214940, 1917; *J.*, 1917, 808.
[68] Fr. Pat. 481149, 1916; *J.*, 1917, 64. Eng. Pat. 102890, 1916; *J.*, 1917, 354.
[69] Eng. Pats. 5169, 1915; 9360, 1915; 100929, 1916, *B. J.*, 1916, 587; *J.*, 1916, 907.
[70] Eng. Pat. 111054, 1917; *J.*, 1917, 1290.
[71] U.S. Pat. 1196718, 1916; *J.*, 1916, 1057.
[72] Ger. Pat. 293004, 1914; *J.*, 1916, 1083.
[73] U.S. Pat. 1200600, 1916; *J.*, 1917, 101.
[74] Eng. Pat. 110993, 1917; *J.*, 1917, 1290.
[75] Eng. Pat. 110689, 1917; *J.*, 1917, 1195.
[76] Eng. Pat. 14095, 1915; *B. J.*, 1916, 561.
[77] U.S. Pat. 1192421, 1916; *J.*, 1916, 944.
[78] Eng. Pat. 7956, 1915; *J.*, 1916, 754.
[79] U.S. Pat. 1240341, 1917; *J.*, 1917, 1148.
[80] U.S. Pat. 1232702, 1917; *J.*, 1917, 1065.
[81] U.S. Pat. 1232077, 1917; *J.*, 1917, 943.
[82] *Phot. J.*, 1917, 72-84; *J.*, 1917, 354.
[83] From *Phot. Korr. B. J.*, 1917, 81.
[84] *J.*, 1916, 817-820.
[85] *Atti. R. Accad. Lincei*, 1916, ii, 165-171; *J.*, 1917, 47.
[86] *Koll. Zeits.*, 1917, 257-270; *J.*, 1917, 1186.
[87] *Kolloid Chem. Beihefte*, 1915, 1-90; *J. Soc. Leather Trades Chem.*, 1917, 45-51; *J.*, 1917, 1243-1244.

Below this point the change of viscosity with temperature appears to be dual in nature; there is the change produced merely by alteration of temperature such as is shown by all ordinary liquids, and the change produced by alteration of structure. The latter is, especially at low temperatures, much greater than the former, and occurs much more slowly. There is for any temperature above the setting point an equilibrium viscosity, which is, however, diminished at low temperatures by stirring. The Tyndall effect was also examined and the curves connecting this and temperature, as well as the curves for viscosity, were found to be quite continuous, with no break at the setting point. These results are quite in agreement with some obtained in the Ilford laboratories with aqueous solutions, which showed from a study of viscosity and of melting and setting points that the properties of a jelly, as well as those of a liquid gelatine solution, are dependent on its previous history, and the rate of attaining equilibrium is much decreased with lowering of temperature; observations on an industrial scale have also shown that the same is true of dry gelatine film, the properties of which depend both on the condition of the solution from which it is made and on the conditions of drying. The patent of Ilford, Limited, with Renwick and Storr[99] for the recovery of silver from weak gelatine emulsions is also of interest in this connection; one of the methods used depends apparently on the interaction between the gelatine network and a colloidal hydroxide formed by the dilution of a metallic salt in a slightly alkaline bath, the reaction not taking place with a perfectly fresh gelatine solution nor above certain limiting temperatures.

Biltz, Bugge, and Mehler[91] have studied the osmotic pressure of various gelatine solutions and arrive at some conclusions as to molecular weight and complexity. They compare also for various gelatines viscosity and gold value (the amount of gelatine solution required to protect a standard colloidal gold solution against precipitation by certain reagents).

Hodgson[92] has published a paper on the physical properties of plate grains, in which some excellent photomicrographs are given in illustration. There is generally a change of shape and an increase of size of grain on development, though occasionally the shape is retained; cases were also found in which development of a grain started from several nuclei. It would be interesting to know the reasons for his conclusion that the silver halide grains are tetrahedra, for silver bromide and silver iodide are both dimorphous (cubic and hexagonal), the latter being hexagonal at normal temperatures, the former either cubic or hexagonal, in the form of hexagonal or triangular laminæ. The "feeler" phenomenon previously observed by Scheffer was noticed only once, and then under such conditions as to suggest an entirely different explanation from that advanced by Scheffer, and having no reference at all to the nature of the latent image. Koch and du Prél,[10] in the investigation already mentioned, also made a microscopical examination of silver bromide grains in various photographic plates, and the effect on them of exposure, development, and fixing.

Saegusa,[93] in some work in the crater of a volcano, obtained reversal which he succeeded in tracing to sulphur dioxide; the effect was only temporary, disappearing if the plates were kept several days. He has examined also the varying effects of different coloured lights[94] and their combined effects on photographic plates; he does not appear to have found any evidence of the antagonism of different colours.

An important contribution to the general subject of photometry is the paper of Renwick[95] on tone reproduction. By a careful consideration of the curves of sensitiveness of both plates and papers, he indicates to what extent it is possible to obtain a print having the same gradation as the original, and also the possibilities of compensating for the errors of the negative by the qualities of the printing paper. The general question as to what relationship it is desirable to have between the scale of tones of the original and that of the reproduction, a problem which introduces both physiological and psychological phenomena, also receives consideration. A number of data are collected and arranged respecting range of vision, degree of visibility, contrast, etc., at varying degrees of luminosity, and their bearing on the subject discussed, along with that of the methods ordinarily adopted by artists.

Bloch[96] has studied the possible variations which may occur in the values obtained for the H. and D. speed number of a plate with variations in the conditions of experiment. He made exposures both with an intensity scale (wedge-screen) and a time scale (sector wheel), avoiding intermittency error in the latter case by using only one slow revolution of the wheel, which was driven by clockwork. The factors actually required to arrive at the value of log i are the composition of the developer, the γ (degree of development) reached, the value of q (in Schwarzschild's rule, $I_q t = I_1{}^q t_1$, for equal densities), the nature of the exposure (time scale or intensity scale) and the actual values of time and intensity. The variation of speed with developer is considerable, ortol giving the highest number and glycin the lowest of those examined, and the variation with γ is very marked in some cases, especially with high-speed plates having long under-exposure curves. With such plates it is quite common with normal development (*i.e.*, to a γ of about 1) to obtain a straight-line curve for the whole of a normal range of exposures; if development is carried far enough, however, the normal curve becomes evident. A speed number obtained from the first curve, which more nearly represents the working speed of the plate, is much higher than the true H. and D. speed number obtained from the second curve. One case also is mentioned in which Schwarzschild's rule was not obeyed.

Padoa and Mervini[97] have determined the temperature coefficients of sensitiveness of various plate emulsions and of citrate paper emulsions for a range of lights of different colours. The former are the same (1.05) for all the colours tested (red, yellow-green, violet, and white), but the latter with white, blue, and ultra-violet light are 1.16, 1.19, and 1.07 respectively.

Hodgson[97] has made a preliminary investigation into the speeds of plates to X-rays. The subject presents some special difficulties because of the fluctuating and intermittent nature of the radiation as ordinarily produced, and the results obtained were only intercomparable, no definite standard of exposure being suggested. To avoid the intermittency difficulty the moving-plate exposing device of Jones was used and a steady output of X-rays was obtained by the use of a Coolidge tube. The curves obtained differ from the usual light speed curves in being more hyperbolic in shape, neither straight-line nor over-exposure periods being evident.

Goldberg[98] has determined the tendency to halation by measurement of the fog produced on a protected part of a plate surrounded by exposed parts, making at the same time a comparison wedge-screen exposure. He has also studied the anti-halation effects of various suggested remedies and confirms the prevalent conception that a coloured film between the sensitive film and support is the most effective. Goldberg (*loc. cit.*) also suggested an improvement in Marten's photometer, replacing the usual powerful lamp by a small glow lamp under the photometer table; the method has been tried in the Ilford laboratories with a decided improvement in the range of the instrument.

Hitchins and Gilbert[99] give a detailed description of the development thermostat in use in the Ansco Research Laboratory. It is on a comparatively large scale and electrically heated and controlled. The developing vessel is an arrangement of two concentric cylinders, the developer being circulated by means of a pump from inside to outside of the inner cylinder, on the outer face of which the plates are suspended.

Luckiesh[100] suggests the use as a correction filter in spectrographic work of a spectrogram placed in correct position on the plate during exposure. Hodgson and Wilsey[101] have calculated the actual density required at any point of such a filter, giving the light intensity and the speed of the plate at that point. The device suffers, however,

[99] Eng. Pats. 16708 and 102168, 1915; *J.*, 1917, 47.
[91] *Z. physik. Chem.*, 1916, 705-712. *Z. angew. Chem.*, 1916, Ref., 540; *J.*, 1917, 47.
[92] Communication No. 56 from Eastman Kodak Research Laboratory; *B. J.*, 1917, 532-534; *J.*, 1918, 20A.
[93] *Math. Phys. Soc., Tokyo. Proc.*, 1917, 56-63. *Sci. Abs.*, 1917, 223.
[94] *Math. Phys. Soc., Tokyo, Proc.*, 1917, 178 185. *Sci. Abs.*, 1917, 561.
[95] *Phot. J.*, 1916, 222-238; *J.*, 1916, 1272.
[96] *Phot. J.*, 1917, 51-61; *J.*, 1917, 353.
[97] Communication No. 63 from Eastman Kodak Research Laboratory. *B. J.*, 1917, 654-657; *J.*, 1918, 39A.
[98] Ver. deut. Chemiker, Oct., 1916. *Z. angew. Chem.*, 1916, 394; *J.*, 1916, 1236.
[99] *Phot. J., Amer.*, 1917, 149-153.
[100] *Astrophys. J.*, 1916, 302-309. *Sci. Abs.*, 1916, 387.
[101] Communication No. 42 from Eastman Kodak Research Laboratory. *Phot. J. Amer.*, 1916, 406.

Correspondence.

*** Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** We do not undertake responsibility for the opinions expressed by our correspondents.*

SODA v. POTASH SALTS.

To the Editors.

Gentlemen,—I was much interested in "Natrium's" letter on the use of sodium salts, which emphasises the advantage of chemical knowledge to the photographer.

I have for many years used the salts of sodium (or other metals) wherever they were cheaper or more convenient than the corresponding salts of potassium, with perfect success.

The physical differences have to be taken into account; for instance, one cannot make so concentrated a solution of carbonate of soda as of carbonate of potash, while the reverse applies to the dichromates. Also with exact formulæ due allowance must be made for the difference in atomic weights, but in most cases this is negligible.—Yours faithfully, F. S. WELLS,

Works Manager to P. G. Hunt and Co.

532, Balham High Road, London, S.W.17.

PLATINUM.

To the Editors.

Gentlemen,—In the "British Journal" of January 10, 1919, page 14, the following statement occurs: "The supply of platinum is still too limited for it to be available for photographic purposes."

This is quite untrue, and the statement is calculated to do great injury not only to us but to high-class photographers who wish to obtain the highest results, both from the artistic and permanent point of view, which can only be obtained by the use of our papers.

Unfortunately the price is very high, but this does not prevent its use, any more than the high price of platinum stops its use for mounting diamonds in place of the old method of using silver for that purpose.

Those who want the best must pay for the best and nothing else will satisfy them.

In spite of the high price of platinum, we have never ceased to supply our Platinotype paper both to Government departments and others requiring permanent records, and to the best photographers who require not only permanence but the highest artistic results.—Yours truly,

ERNEST HUMPHREY.

The Platinotype Co., Penge, London, S.E.

THE ASSISTANT QUESTION.

To the Editors.

Gentlemen,—I have been forced to notice the various opinions expressed in the Journal regarding assistants.

The notion of a union of photographic workers seems to me not only advisable but imperative in view of past conditions, which, I am confident, are not looked back upon with any great degree of pleasure. Take the case of a man of my acquaintance, a thoroughly good and clever worker (no thanks to the employer to whom he was apprenticed), who before the war received the princely remuneration of 25s. a week, and was expected to run the whole show from operating to window cleaning. What an ideal condition to be sure! To my mind it is existing, not living.

Personally, I think that prices should remain high—that is, within the purchasing power of the masses. Then perhaps it will be possible to continue the giving of a fairer and better wage than existed in pre-war days when the transition stage is over.

There should be a body of men consisting of an equal number of employers and workers who should arbitrate in the case of an employee being dismissed against his desire. The findings of this committee should be binding not only on this question, but on others. A fixed minimum wage is necessary for all skilled workers, who should pass an examination to render themselves eligible for that minimum. Hours of working should also be fixed, and an effort made to better conditions under which a great many have to carry on.

Considering the possibilities of things in general and a union in particular, which should surely lead to the betterment of conditions and a closer relationship between master and worker, I cannot but think that apathy reigns supreme in the ranks of present-day workers, male and female. The motto should be "Up and doing." Don't let this chance slide, for if you do you will never have another. Realise your possibilities and remember that the worker is worthy of his hire.—Yours faithfully, W. E. B.

THE CULT OF THE MODEST COUNTENANCE.

To the Editors.

Gentlemen,—In a letter which appears on page 19 of last week's "B.J." a correspondent calls attention to the soda versus potash question, and quotes an American editor who asked his readers if they had noticed how potassium salts had been boomed to the advantage of Germany. Probably the majority had not, as there is much that is happening in our midst which passes unnoticed.

The question about the chemicals is interesting enough, but I wonder how many photographers in our own country have noticed a revolutionary move in their own profession during the past year or two. I do not refer to any German propaganda, real or supposed, but to the very quiet disappearance of picture postcard portraits of smiling actresses and professional beauties from the shop windows and market.

Not so very long ago portraits of stage favourites wearing what was known as the "Odol look" and showing rows of pearly teeth were as common as modern O.B.E.s. The fixed inane grins depicted by the camera and sold to us on postcards were legitimate subjects for the pencils and pens of humorous artists and writers, who lost but little time in ridiculing them; but now all has changed.

Who are we to thank for the more happy state of affairs, for the more beautiful and restful poses, and for the cult of the modest countenance? Are the more pleasing poses due to the whirligig of time and fashion, to ridicule on the part of artists, writers, and the public, to the craze of the Thespians of minor importance for imitating their betters, to the good sense and persuasions of photographic operators, or what? Like the American editor your correspondent quotes, I think I have made a "great discovery" concerning the matter.

The change is, in my humble opinion, due to the good sense of the most famous of the postcard beauties of to-day, a lady who has been photographed more times than any of those who have reigned in the past, and I need hardly say that I refer to Miss Gladys Cooper. Recently I examined a collection of portraits of the lady named, not one of which pictured her grinning. She invariably chooses the restful and more realistic type of pose, and being the leading and most photographed beauty of to-day, others of her calling who are not so favoured by nature have copied her manner of facing the camera.

All in the postcard portrait trade are, I believe, agreed that the coming of the saner and more pleasing of the poses depicted upon commercial postcard portraits coincided with the entry of Miss Cooper into the ranks of beautiful Englishwomen. But although such a great change has come over the postcard portrait of commerce, I find that very few people—particularly photographers—have noticed it.—Yours truly, L. T. W.

FORTHCOMING EXHIBITIONS.

February 20 to 22.—Leicester and Leicestershire Photographic Society. Secretary, H. C. Cross, 80, Harrow Road, Leicester.

February 22 to March 8.—Edinburgh Photographic Society. Entries close February 13. Secretary, George Massie, 10, Hart Street, Edinburgh.

Answers to Correspondents.

SPECIAL NOTICE.

In consequence of general reduced supplies of paper, as the result of prohibition of the importation of much wood pulp and grass, a smaller space will be available until further notice for replies to correspondents.

Moreover, we will answer by post if stamped and addressed envelope is enclosed for reply: 5-cent. International Coupon, from readers abroad.

The full questions and answers will be printed only in the case of inquiries of general interest.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

ARTHUR HANDS.—The Tella Camera Co., 1, Southampton Row, London, W.C.1.

VALUE.—1. List price, £13; worth now about £4. 2. List price, £9; worth now about £3 10s. 3. List price, £4 5s.; now worth about 30s. each. 4. Now worth about 25s.

H. H.—Under the Act which has been in force since 1912 registration of copyright is no longer necessary. If you have dealings in copyright matters we should think that the handbook "Photographic Copyright," which we have issued embodying the regulations under the Act, would be of value to you.

H. P. Ever since the 1911 Copyright Act came into force registration of photographs has been no longer necessary in order to obtain copyright in them. As you appear to be unfamiliar with the present copyright regulations the purchase of the little manual which we issue would probably be of advantage to you.

TEXT BOOK. Will you kindly inform me where I can obtain a work that gives general information—in other words, a book of instruction up to date? For four years I have been under Government employ, and have almost forgotten all I had learned by practical experience prior to the war.—VERONICA.

The best general text-book is "The Science and Practice of Photography," by Chapman Jones, price 6s.

G. A.—Ross Universal No. 2, view size, 10 x 8; group size, 8½ x 6½; diameter of lenses, 2¼ inches; back focus, 10¾ inches; price, £9. The original series of universals were *f*/6 portrait lenses, very similar to the Dallmeyer D series. The full aperture is about *f*/6, and the other apertures probably require double the exposure at each step. At the present time they should be worth half-price. We are unable to give date of manufacture.

LENS TEST.—1. I have a Goerz Dagor 1 1 lens, *f* 8, but am not at all satisfied with the definition of my outdoor work generally, and would be pleased to know if I could have it examined and tested at the National Physical Laboratory, and where is the postal address? 2. Can you please tell me if and where I can obtain an electrical apparatus for igniting flash powder without any electric current on the premises?—DEFINITION.

1. The address is Teddington, Surrey. 2. Messrs. Boots sell a small lamp in which the ignition is effected by means of an ordinary pocket flash-lamp battery, which might answer your purpose.

E. G.—In order to light magnesium powder by means of methylated spirit you require to blow the powder through the spirit flame. You cannot ignite the powder by means of spirit flame. If we were you we should abandon the spirit pattern of lamp and employ a self-combustible mixture of magnesium and some chemical such as you can best buy ready made, although you can with some considerable danger make it for yourself, but it is a rule of ours not to recommend formulæ for the making of flash-powders.

S. D.—Spots on the postcards have the appearance of fixing stains, the result of obstruction of hypo to the film from some cause or other. This latter may be air-bells due to handling too many prints together, or might arise from causes in the paper itself. We should try for a start to make a practice of handling prints very thoroughly in the fixing bath and then passing them through a second bath again with very fully turning over. If the spots still persist when prints are thus treated, we think the matter is one which should be taken up with the makers.

H. M.—We can thoroughly recommend the half-watt lamps as giving the nearest approach to daylight effects that we have seen. The specimens in the booklets do some injustice to the light. By judicious screening you can secure any degree of brilliancy. We have not heard of anyone combining mercury vapour and half-watt lamps. If you instal the latter you will not want to be bothered with the mercury. We have not found a better way of using the mercury vapour tubes than the one you mention. Four to six 1,000 c.p. half-watt lamps are the most generally useful selection, as by so dividing the light you do not need to waste so much in diffusing it.

F. M.—The problem you set is a difficult one. The gaslight is out of the question, as in such close quarters the heat would be terrific. The only thing we can suggest is that you should use an enclosed flashlight so that the smoke could not escape into the studio. You could fix, say, four incandescent burners to focus by, and these would help the exposure a little. Can you arrange a pipe to the open air to carry off the smoke? With regard to the printing box, we would suggest a piece of looking-glass in place of the card. This would practically have the same effect as exposing direct to the burner, and we think you will have sufficiently even illumination if you pick out a bit of good plate; wavy sheet glass is no good, as it will give patches of light.

The British Journal of Photography.

IMPORTANT NOTICE.—Advertisers are requested to notice that the prices printed below represent an

Increased Scale of Charges,

which is now in operation in respect to all line announcements.

Since advertisements cannot be inserted until fully and correctly prepaid, senders of line announcements are asked to bear in mind this revised tariff. They will thus save themselves delay in the publication of their announcements.

Net Prepaid Line Advertisements.
Increased Tariff of Charges.

12 words or less	1/-
Extra words	1d. per word.

(No reduction for a series.)

Special Note. Adv'ts under a Box Number.

"Box No." and office address	charged as 6 words.
For forwarding replies add ...	6d. per insertion for each adv't.

If replies are called for this latter charge is not made.

Advertisements cannot be inserted until fully and correctly prepaid.

Orders to repeat an adv't must be accompanied by the advertisement as previously printed.

Advertisements are not accepted over the telephone.

The latest time for receiving small line advertisements is 12 o'clock (noon) on Wednesdays for the current week's issue.

Displayed Adv'ts should reach the Publishers Monday morning.

The insertion of an Advertisement in any definite issue cannot be guaranteed.

HENRY GREENWOOD & CO., Ltd., Publishers, 24, Wellington Street, Strand, LONDON, W.C. 2.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3064. Vol. LXVI. FRIDAY, JANUARY 24, 1919. Price Twopence.

Contents.

	Page
Ex Cathedra	33
Re-Settings	34
Carbon Printing by Artificial Light. By S. S. Richardson	35
Practices in the Studio. By Practicus	36
A Commission System for Receptionists. By Newton Barrie	37
Photography's War Work	39
Photo-Mechanical Notes	39
Patent News	40
Meetings of Societies	42
Commercial and Legal Intelligence	43
Correspondence— Early Chapters of Photographic History—The Assistant Question	43
Answers to Correspondents	44

The Summary of contents which usually occupies the lower half of this column will be found at the foot of the page overleaf and will continue to be placed there whilst its regular position is required for notices relating to the forthcoming "B.J. Almanac."

Demand—and Supply.

Year by year, since the dimly distant date of August, 1914, it has been necessary to adjust the production of the Almanac in accordance with the circumstances of the time. A year ago we issued only 15,000 Almanacs; they were all speedily bought. This year no more than this number will be available, and the whole edition has been ordered by the trade distribution firms.

Let there be no mistake; a book such as the Almanac, particularly at its now increased prices of 1s. 6d. and 2s. 6d., is not ordered by dealers for chance sale. There are probably very few copies among the thousands already ordered which are not, in fact, earmarked for somebody or other, that is to say, included in our publisher's large totals because somebody in Santiago or Dudley Port months ago told his dealer to secure it. It is for this reason that we must counsel the reader to place a definite order if he wishes to make sure of the 1919 volume. We have urged this precaution in past years because of many instances of its necessity; it is even more needed in the present instance, when the demand is greater than a year ago.

So the 1919 Almanac will come to its readers with a certificate of merit written, so to speak, in the circumstances of the time. The fact that it is wanted in numbers greater than those available serves to mark its indispensability year by year to those engaged in photography in any way.

EX CATHEDRA.

Dark-Room Lighting. We recently were in the dark-room of a photographic friend whose amateur experience in electric wiring and battery making had been applied in the provision of what he regarded as luxuries in the way of illumination. We are not so sure but that, for a commercial dark-room, there were little more than the necessities for minimising waste of labour. We should explain that our friend's dark-room, which was of ample size, and had the customary developing bench in one corner, had cupboards the contents of which were clearly seen by means of a little yellow electric bulb worked from a battery and connected to the latter so that the opening of the door completed the electric circuit whilst its closing switched the light off again. In many commercial dark-rooms where from lack of space elsewhere things are kept which are not needed in development operations a device of this kind would often save the time of a second assistant who might be wanting them whilst the dark-room was in use. Naturally enough our friend's room was fitted with two types of lamp, one with the safe-light nearly vertical for the examination of negatives, and another of the horizontal pattern for use in the development of prints. Another fixture, and one which we have regularly used ourself, is a ceiling light consisting of a fairly large lamp placed a foot or so from the ceiling with its safe-light uppermost. The illumination, after its reflection from the ceiling, provides a weak, but safe, and very comfortable light throughout the room.

* * *

Passe-Partouts. The passe-partout method of framing may very reasonably be thought to be one which will retain its popularity—certainly among amateur photographers and, no doubt, among the customers of professionals, to whom, however, it has not been offered as freely as its artistic possibilities warrant. It is sometimes astonishing to us to notice the ugly designs of frames which are shown in the show windows of photographers whose taste, judging from their own work in portraiture, might be thought to be a good deal better. The passe-partout with its ready adaptability to the key and colour of the print is particularly fitted for the display of window specimens, and, as we have said, might well be offered to the customers of a studio more than it has been. Perhaps the manufacturers may do something towards further popularising this form of framing; the altogether charming metal edging which for some year or two now has been on the market is one way of overcoming an objection to the passe-partout, viz., the impermanence of its paper binding. Messrs. Butcher have done something in the same direction by providing the slender frames, which are practically more or less solid surrounds for passe-partouts. More might certainly be done in this way by

providing in one form or another a frame for the passe-partout which need only be of the lightest construction, since any hanging tabs or rings are attached to the back of the passe-partout itself, and the accessory frame thus relieved of any weight.

* * *

Fastest Fixing. Among other suggestions which we recently made to a correspondent who sent up a batch of stained paper negatives was that of using a hypo bath of the maximum fixing speed. Where, as in the case of such negatives, the process of fixing cannot be seen by the eye it is more than ordinarily necessary to arrange matters so as to secure complete fixation. As was ascertained some years ago by Mr. Welborne Piper in the course of a lengthy series of experiments, a fixing bath of 40 per cent. strength, that is to say, 8 ozs. dissolved in water to make 20 ozs. of solution, fixes more rapidly than any which is weaker or stronger. Although these experiments were made with a particular emulsion, our own experience with plates of many different makes has shown us that for practical purposes the strength of bath above-mentioned may be taken as that which fixes in the shortest time. Obviously more hypo is required to make up a bath of this strength, but, setting aside loss from sheer carelessness, such as splashing the solution about, there is no reason to believe that a bath of this strength is any less economical in use than one containing, say, only 4 to 6 ozs. in a pint of water. We have yet to find a plate with which a bath of this maximum strength cannot be used. In the case of papers it may easily happen that frilling or blisters may arise from the use of a fixing bath of this strength, although in our experience such effects have been very rare.

* * *

An Enlargement Attachment By those photographers who require to make an enlargement only on comparatively rare occasions the studio camera may be very suitably employed. The addition of a small attachment serves to convert it into an enlarger capable of making a print of the size of the largest plate which the camera will take. The attachment consists simply of a box mounted to slide, by means of a panel, in the grooves which carry the camera lens. The box is provided at one end for the reception of the negative to be enlarged and at the other with an R.R. lens of focus suitable for the purpose. The distance between the diaphragm of the lens and the negative will naturally be adjusted in correspondence with the degree of enlargement required. For this there is the very simple rule that the distance will be one focal length plus one-half, one-third, one-fourth, according as the enlargement is to be two, three, or four times. Where the studio does not provide a ready outlook to a clear sky for the illumination of the negatives, the necessity of tilting the camera may be avoided by using a reflector in the shape of a mirror, or even a white card placed at an angle of 45° to the plane of the negative. An alternative where electric light is used in the studio may consist simply in placing this reflector, or rather the white card, a few inches below an arc lamp or a half-watt bulb.

RE-SITTINGS.

The question of re-sittings is one which perennially crops up, although we do not think that photographers have so much to complain of in these days as they had a few years ago. Probably the broader style of treatment which is now general has a good deal to do with it, while more intelligent and less mechanical retouching has also had an effect. Still, they are common enough to be reckoned one of the plagues of professional photography, and we have to consider the best way to deal with them.

In the first place, the operator will save himself much heartburning if he can bring himself to realise that the sitter does not usually intend to cast any imputation upon his ability. The old hand knows this, but the young artist is apt to take the return of proofs with perhaps rather a pointed remark or two as a sort of blow in the face, and either to contest the matter or to yield with rather a bad grace. That is quite the wrong thing to do. He should endeavour to see the matter from the sitter's point of view as well as from his own, and to do all that he can to give satisfaction. Personal recommendations are the best possible advertisements for any business, and a dissatisfied client will often be the means of diverting many profitable orders, while the assurance that polite and considerate treatment can always be expected will have the contrary effect. There are few people whose genius is so transcendent that they can afford to be ungracious, not to say rude, so that our advice is to stifle one's feelings and to accept an unpleasant situation with a smile. There are, of course, exceptions to this rule, and if the photographer can see that an attempt is being made to impose upon him there are good grounds for protecting himself against it.

It is not wise to mention the subject or to make any conditions as to re-sittings on any price list or even

SUMMARY.

Re-sittings and the best way to deal with them, with notes on their avoidance, form the subject of an article on page 34.

An article on carbon printing by artificial light points out how single transfer prints may be made from non-reversed negatives if an illuminant of small area be used. (P. 35.)

Notes on backgrounds, their significance, construction, and use, with hints on fitting and renovation, are the theme of the "Practicus" discussion on page 35.

The possibility of improving the class of work done and obtaining better financial results from a given number of orders is dealt with in a paper on page 37.

Some remarkable figures illustrating the magnitude of the photographic work done by the R.A.F. during the last few years of the war are given in a reprinted article on page 39.

A clear exposition of the qualities which are essential in a good negative for photo-litho work will be found on page 39.

An improved method of coating celluloid with emulsion, whereby an even film is secured on a slightly buckled base, is the principal item in Patent News. (P. 44.)

A report of the last meeting of the Edinburgh Society of Professional Photographers appears on page 47. The paper read by Mr. Barrie will be found on page 37.

The affairs of two well-known photographers were before the Bankruptcy Court last week. A report will be found on page 43.

A simple enlargement attachment, which can be made at home and fitted to any large studio or other camera, is described on page 34.

Stains on negatives and prints, lens matters, and the introduction of extra figures into groups are among the subjects dealt with in "Answers to Correspondents." (P. 44.)

The utility of auxiliary non-actinic light for illuminating corners and cupboards in the dark-room is pointed out on page 33.

The passe-partout style of mounting for window specimens and as a saleable line to sitters is commended on page 33.

Rapid fixing is a desideratum in many branches of photography. A certain strength of solution gives the most satisfactory results. (P. 34.)

The education of assistants still forms the staple topic in Correspondence. (P. 43.)

verbally at the time of sitting, as this shows a lack of confidence. If re-sittings are so frequent as to be a serious matter it is a sign that there is something wrong with the work, and a decided attempt should be made to remedy it. In many cases faulty or excessive retouching is to blame, and in others a want of attention to small details in dress or posing. Therefore, in every case it should be ascertained what the fault is before proceeding with the second sitting.

Various plans have been tried for avoiding loss in this way, but most of them are open to objection. One is to make a charge if any alteration is made in the dress or style of hairdressing. This appears fair at first sight, but it puts an unpleasant restraint upon the sitter, who may have good reason for complaint, and who can see that certain modifications would help to secure the desired result. Another method is to charge a moderate fee for the sitting and a set of proofs, after which copies may be ordered at a fixed price each. This has its advantages, but as a rule if the proofs are not quite satisfactory the sitter does not return, but tries another studio, so that it is a question of half a guinea sitting fee and no further order or a two or three guinea order with a possibility of a re-sitting at a cost of two or three plates, with perhaps an additional order at the end. In many studios it is the custom to destroy negatives which are not at once approved of, and if the sitter does not wish this to be done to charge a registration fee of, say, half a crown if they are to be kept. Occasionally a sitter will ask for this to be done, in case the second sitting is no more satisfactory than the first. It may be worth while to adopt this plan, but it seems to us that the fewer conditions imposed in an intimate business like portraiture the better.

After all prevention is better than cure, and every step should be taken to avoid the necessity rather than to remedy it when it comes. In the first place, we must remember that the average sitter has no clear idea of the powers of the retoucher, therefore rough proofs should never be submitted unless the negatives are really good and require but little work upon them. It is difficult to explain that this can be altered and that can be altered; the sitter is not so sure about it, and presses for a re-sitting which would not have been asked for if the alterations had been made before proofing. We have noticed that those portraitists who do most of the work themselves are less troubled than the large businesses where it is carried on on more or less a factory system.

Another point is that sufficient choice of poses should be offered to the sitter. One of the most successful businesses has been built up on the principle of submitting six proofs for an average order. Some people have called this taking your re-sittings beforehand, but it is eminently sensible not only as helping to avoid a second trial, but because with so many positions to choose from the original order is in very many cases increased so that on the whole the additional outlay brings in a good profit. At the present price of plates this may not be regarded as advisable, but there is a wide margin between six proofs and the two which are often submitted.

Whenever it is possible the granting of a re-sitting should be done by the operator and not by the receptionist. The latter may be an excellent business woman, tactful and obliging, but she has rarely the artistic or technical knowledge which are necessary to decide the point. Moreover, the sitter enters the studio with less diffidence if the question has been settled with the person whom she considers is in fault. It should hardly be necessary to say that no proofs with which the photographer himself is not satisfied should be sent out without remark. In such cases it is well worth offering a re-sitting at once. It may not always be accepted, but if it is the sitter comes back in a pleasant mood, which is decidedly helpful. All this is an old story to those who have spent many years in studio work, but we hope that it will go some way to smooth over a disagreeable side of life to those who are still young at it. In every walk of life we are open to criticism, and photographers should be thankful that they are not politicians whose incompetence we see denounced every time we open a newspaper.

CARBON PRINTING BY ARTIFICIAL LIGHT.

Although many photographers, both professional and amateur, will be familiar with the fact that the printing of carbon tissue can be done conveniently with the stronger sources of artificial light, such as the electric arc and mercury vapour lamp, as well as by daylight, it does not appear to be so well known that by choosing a suitable source of light prints without the usual lateral inversion can be obtained from ordinary glass-plate negatives by the process of single transfer only. A few remarks on the method of obtaining such prints may therefore be of interest to those who have the necessary facilities in their studios or homes.

To obtain the unreversed print the tissue must be placed in contact with the plain glass side of the negative, the latter being placed in the printing frame with the film towards the light. The negative must then be illuminated by a very small but sufficiently actinic source, and care must be taken that as little light as possible, other than the direct rays from the source, falls on the plate during the exposure.

The most convenient and satisfactory illuminant is undoubtedly the comparatively new Ediswan "Pointolite" lamp. The actual source in this lamp is a small metal ball, the diameter of which is about two millimetres, supported in the centre of a glass bulb some 10 centimetres in diameter. The ball is rendered incandescent by a small electric arc, which is obtained by placing a second electrode immediately over the ball. The usual rating is 100 candle-power, and the current required about 1.5 amperes. This intense and practically "point" source of light is highly actinic, and forms an ideal illuminant for many optical purposes. In using the lamp for the purpose under consideration it is well to place the negative at one end of a box coated inside with a dead black, and to place the lamp outside the box at the other end. A small rectangular hole is to be provided in this end, so that when the lamp is placed as close as possible to the hole the beam of light which enters the box will just cover the film of the negative. The distance between the centre of the bulb and the negative may be 20 centimetres, or even less. It is clear that a number of negatives may be printed at the same time, the bulb of the lamp being placed for this purpose in the middle of a circular or, say, octagonal box with suitable radial partitions; light reflected from the film of one negative must not be allowed to fall on the others. When six negatives are printed at once the cost of printing may be less than that of the final support used in the double transfer process, and there is, of course, also a considerable saving of time. With negatives of average density the time of exposure required is 40 to 50 minutes. The time may be shortened, if fine definition is not required, by reducing the distance between the negative

and the lamp. It may be added that the "Pointolite" takes so little current that it may be connected to any lamp-holder, special wiring not being required.

A second illuminant which will be found to give satisfactory results is the iron arc, but this can only be used where ordinary arc lights are installed or where the electrical fittings allow the use of a current of 5 or 6 amperes. The advantage of an arc with iron poles instead of the usual carbon poles is that the iron burns away very slowly, so that no "feed" is required. In fact, the lamp in this case may consist simply of two iron rods, 1 or 1½ cm. in thickness, supported in the same vertical line with a space of about 4 mm. between their nearer ends. The poles must be, of course, insulated, and connected to the mains in the same manner as the ordinary arc lamp. The arc is most conveniently "struck" by drawing a third iron rod across the ends of the pole pieces. Once the poles become hot the lamp will run for long periods, sometimes for hours, without requiring attention. If the power is supplied by direct current the upper pole should be made the negative one. It is well to place a tray containing water below the lamp, as occasionally small pieces of molten iron may fall. As the light is very rich in ultra-violet rays it should not be used except when the eyes are protected by plain glass or ordinary spectacles. With this more powerful source a larger number of prints may be exposed at once, the frames being arranged in a circle, say 50 cm. from the light. At this distance no special screens are necessary, and reflection from surrounding objects is of no account unless they are light-coloured. The exposure required at 50 cm. is about 20 minutes, with a current of 6 amperes.

With the distances quoted above the diameter of the circles of confusion representing the points of the image is about .005 mm., but there is a slight loss of definition which appears to be due to reflection between the front and back surfaces of the negative. The want of sharpness, however, is remarkably slight, and in most cases amounts to no more than a softening of the otherwise hard lines of the picture, an effect which in many subjects is quite pleasing.

S. S. RICHARDSON.

PRACTICUS IN THE STUDIO.

BACKGROUNDS.

THE modern photographer regards the background of a picture in a very different light from his predecessor of twenty, or even ten, years ago. Then it was the custom to use elaborately painted scenes, which were supposed to be more or less suited to the social standing of the sitter. Usually they were highly incongruous, and we often found such combinations as a butcher-boy in a tropical conservatory or a lady in evening dress waiting by the banks of bonnie Loch Lomond. I well remember one enterprising firm who went so far as to have the entrance to Hyde Park accurately reproduced with real posts and rails for church parade sitters, and an interior of one of the salons in Buckingham Palace for court dresses. This sort of thing was borrowed from a certain school of portrait painters who considered it necessary to depict their models in what they considered an appropriate entourage. Fortunately we have changed all that, and the scenic background is rarely used except in the "while-you-wait" studio, where it serves to cover up finger-prints and stress markings—in other words, it has almost entirely "retired into the background." The painter had one reason for introducing scenic effects into his pictures which does not apply to photography, for his subject being fully coloured often called for a foil, a warm-toned curtain, or sometimes even a conflagration, as in some naval or military portraits being used to modify a rubicund complexion, while a delicate sky or light foliage served to enhance the charms of a blonde beauty.

The modern photographer has evidently taken a lesson from stage lighting, in which a concentrated light is often thrown upon the principal character, while the garish colours of the scenery are allowed to remain in semi-obscurity; and this has been all to the good as far as the artistic nature of the result is concerned. Many photographers now confine themselves to plain backgrounds. It is a safe course, although one sometimes feels that a little relief would often be acceptable, especially for half and full length poses. Hence a dark cloud or suggestion of foliage is often useful, as it allows the figure to show more relief by opposing a light portion to the shadow side of the sitter. There is one disadvantage in using this class of background because it is not always possible to bring the light patch into the desired position. This was overcome by a device, little known in this country, which consisted in having the background made in an endless belt running over two rollers, something like a roller towel, by which the height of any portion of the surface can be adjusted to a nicety. Such a background may carry foliage suggestions, clouds, and plain surfaces in various sections, as the length of 16 ft. affords ample room. Another device for securing gradation was to have the ground made in the form of a shallow saucer, which gave a perfectly natural effect of light and shade just where it was wanted. Such a construction was found in practice to be too unwieldy for general use, and a more convenient way of carrying out the same idea is to have a tall screen made of narrow strips of wood glued to an ordinary plain canvas background of a medium grey tint. This can be placed so as to form a kind of alcove behind the sitter, more or less concavity being given as harder or softer gradation is required, or even be used flat, while when done with it can be rolled up and put in a corner. To make the method of construction quite clear, I will compare it to the roller shutter of a studio dark slide, the wooden slips being, of coarse, turned away from the sitter.

Tapestries and curtains form effective backgrounds if judiciously used, but neither the pattern nor the folds should be pronounced in character, only enough being shown to break up the flatness of a plain surface.

The illumination of the background has an important effect upon its depth of colour, and much may be done by turning it to or from the light, while the distance it is placed under the drawn blinds gives somewhat similar modification. Thus, to obtain the darkest effect from any given tint of grey, we keep it well back from the sitter and bring the edge nearest the side light as far forward as may be, the reverse being done when a lighter tone is required.

In the case of white backgrounds for "sketch" work it is usually recommended to light these independently by opening the blinds behind the sitter. This is all right in a dull light, but on a bright day the flood of light so projected into the lens is very likely to cause a general fog over the negative. Certainly if the quality of the work is to be considered it is better to secure opacity by Mr. Adamson's method of using red ink and seccotine on the back of the negative.* A common error is to paint sketch backgrounds a bluish-white, the idea

* "Sketch Portraiture," "B.J." Office, 10d. post free.

being that a denser deposit will be obtained. This is quite wrong; nothing can be whiter than white; the blue only masks any yellow tint in the distemper, and there is no gain by adding it.

From time to time attempts have been made to print in backgrounds from film negatives interposed between the portrait negative or to put in backgrounds on the back of the glass. These plans are rarely satisfactory, though in some cases excellent results have been obtained. As a rule, however, the general effect is not so good as from a background which has been photographed with the sitter.

The materials used for backgrounds are various. For plain tints Melton cloth is excellent when it can be obtained. Failing this, distemper on canvas or stout sheeting is very suitable. For graduated backgrounds distemper may also be used, but it requires a considerable degree of skill to apply it, so that th necessary softness is obtained, and for this class I therefore prefer flatted oil-colour, which does not alter in depth upon drying, and which can be easily worked and softened while wet. Aerograph work upon a plain grey distemper foundation answers very well, but it takes some time to cover so large a space. The aerograph is also excellent for subduing contrast in scenic backgrounds which are too contrasty. I have also improved such by rubbing on black chalk powder exactly in the same way as in finishing an enlargement, but care must be taken to avoid patchiness if there are decided brush marks on the surface. For small grounds up to 54 in. wide dark green or red serge is very good, and a little light may be introduced by dusting powdered French chalk on where required. This is easily removed with a clothes-brush if the plain surface is again required. If you wish to distemper your own backgrounds it is better to purchase one of the many ready-made distempers or to use the Kalko powders (Vanguard Co.), which are specially prepared for this work. Oil-colours should not be purchased ready mixed; they should be procured "ground in oil" in a stiff paste, and this should be thinned down with turpentine or one of the current "turpentine substitutes."

Lincrusta and Anaglypta are useful for making imitation panelled backgrounds. The latter, being a kind of embossed papier mâché, is the cheaper, but will not stand knocking about so well as the Lincrusta does.

Now that we do not require so many backgrounds the old-fashioned multiple stand should be discarded and the material should be stretched upon light wooden frames fixed upon feet with castors, so that they may be moved about the studio easily and used at either end or diagonally, as may be desired. It is a good plan to have the ends of the studio finished so that they may be used as backgrounds. This has also the excellent effect of preventing the space behind the movable screens being used as a receptacle for lumber. The oak panelling comes in very well for this, and if the entire end be covered a large group can be accommodated without having to eke out the ordinary-sized ground with curtains, side slips, and other make-shifts.

As a guide to those who are attempting to make or renovate their own backgrounds for the first time, I give the following hints. Do not expect to get an even surface with one coat of distemper. You may do so but, if not, do not be discouraged, apply a second coat rather thinner in consistency. If working on new canvas or sheeting it is a good plan to give a first coat or filling of thin size, or even starch or flour-paste. This prevents the distemper from being sucked into the material, and makes it easier to apply. For oil colour, ordinary glue size is to be preferred. A large paint brush, about three inches across, is easier for the amateur to manage than the orthodox distemper brush, and should always be used for oil. Work quietly, and do not slop on too much colour at once. A good grey can be made by mixing a little Venetian red and blue with the black and white. This looks warmer, and photographs better than black and white alone. Remember that distemper dries many shades darker than it appears when wet; therefore before using your mixed colour try a patch on brown paper and dry it before the fire: you will then know what your background will look like when dry. A very little white will turn black into a light grey. Do not buy black in a dry powder, as it is very difficult to mix; ask for black ground in water. Always strain your distemper through muslin before using, or else you will get streaks which are caused by unmixed particles of colour which break up under the brush.

There is a right and a wrong way of nailing a background on to its frame. The wrong way is to fasten all four corners and then to go round the sides. The right way is to drive a strong tack in the middle of the top edge, then to pull the canvas as tightly as possible and drive another tack in the middle of the bottom; then fasten the two sides in the same way. Having got a straight pull these two ways, begin driving in tacks about one and a-half inches apart towards the corners, always working from the centre. In this way any fulness is drawn out as you go on, and the background will be perfectly flat and free from wrinkles. It is a good plan to fasten a loop handle of iron or brass at each side of the frame; this obviates the necessity of handling the edge of the wood, and keeps the background in much better condition. If the frame is wider than you can stretch, a loop of webbing or cord, about eighteen inches long, should be fastened to one of the handles. Holding this and one handle, you can easily move an eight-foot frame single-handed, although if good castors are fitted it may not be necessary to lift it very often.

PRACTICUS.

A COMMISSION SYSTEM FOR RECEPTIONISTS.

SOME FACTS AND FIGURES ON A METHOD OF INCREASING BUSINESS.

(A Paper read before the Edinburgh Society of Professional Photographers).

THE paper which I am about to put before you to-night is not with any idea of abusing that very popular side-line, the post-card, which, as we all know, has given such great pleasure to our soldiers at the Front during the long period of the greatest war the world has ever known; but my object is to endeavour to explain to you how clients for these and other small portraits can, by a little tact and co-operation with your assistants, be persuaded to have a superior and more artistic style which will give greater credit to both yourself and your sitters; and I am sure, now that the war is over and we are all looking for better times, this is a most suitable moment to make every effort to raise the standard of photography in general.

Now, can any of you conscientiously say that you have not at some time or other, when you have been looking round your reception-room and workroom, said to yourself that you do not like to see so much small work about which does not do you credit, knowing your ability to produce superior and more artistic styles, and you wish something could be done to educate the general public to a more high-class article. As at the present time wages and materials are so very high, and are likely to remain so for some time to come, something should be done to meet these extra expenses.

Some time ago a friend of mine told me he was having far more work, but very little more turnover on account of the great

demand for small work, and no doubt some of you have experienced the same. Now, the remedy lies with you and the reception room. For instance, a sitter calls at your studio for a sitting. Most receptionists will say, with their usual stock phrase, "Any particular style?" or "What size would you like?" etc. This naturally gives an opening for the request for the size now so popular—the postcard; and the customer will be shown specimens in the usual way, and will give an order for one dozen at, say, 7s. 6d. or 10s. 6d. (more or less). Now, the customer naturally gives them to friends, and in return, sooner or later, they present one of a similar size, and that represents altogether 144 portraits, likewise your advertisement, and would vary from £4 10s. upwards, according to the price of the article, representing a great amount of work and a very small turnover. So much from the sitter's point of view.

Now, we will take our view of the question: the £ s. d. side, the business point, the main issue. We will now suppose another sitter will patronise a studio which has adopted the following principle. The client wishes to be photographed, and is tactfully shown one of your most lucrative productions, priced, just for the sake of argument, at a guinea and a-half per dozen, without asking or waiting to hear what size is required. We will suppose your customer to say that it is a little more than he or she wishes to pay. Instead of bringing forward smaller work I would suggest him or her having eight copies for one guinea or upwards, and might, if the sitter desires to pay something less, even suggest four copies for 10s. 6d. Now may come the time when your customer might say (which is often the case) that she had never had a successful portrait, and thought of only having a postcard, and if it was good would have a larger size. To me, and also to you, there is nothing like the order being booked; you know the old adage, "A bird in the hand is worth two in the bush." This is the opportunity for your receptionist to use her tact and bring out her business abilities. She will suggest to her customer that in the case of a postcard only one plate would be taken and no proof could be given, whereas for those at one and a-half guineas two or three proofs of different positions would be submitted for selection, and a more satisfactory portrait would be likely, in which case your customer, unless she is looking for something cheap, will, nine times out of twelve, see her position, and in all probability give an order for the dozen, and that represents £1 11s. 6d. or more. And when your customer gives her portrait to her friends it is not likely they will give in return one of inferior value; and if that does not benefit you it will the photographer whom they have been in the habit of patronising, which, totalling up the amount, represents £18 more or less instead of £4 10s. (money circulated). Some of you will ask yourself where these clever and valuable young ladies are to be found in these days of shortage of assistants, what with the Wrens, Waacs, and Wrafs, etc., whose ranks so many have loyally joined. I wish to point out that a method which I myself have adopted does not altogether necessitate years of experience to achieve the object in question, as I am about to show you. Tact and a congenial manner are the main assets to book an order, so long as you have experienced hands in the background to carry it out. And now I think these few remarks have cracked the shell from which I am about to extract the kernel.

To obtain this valuable end it is necessary for you all to look for aid from your receptionist, who is the first to receive your clients. It is in your power and interest to make her post as lucrative as possible. No doubt some of you will say you are already paying as much as, and in some cases more than, the receptionist is worth. But has it ever occurred to you that a little additional encouragement by way of commission on your better work—say, for instance, on all amounts of a guinea and upwards, or about half-a-guinea, where the principal orders of a business are equivalent to postcards—and which I shall show you presently—will decrease your amount of work and increase your turnover? I wish you to note distinctly that too large a commission is not advisable, since what is most easily earned is often the least appreciated. And you must on no account make any reduction in the present wage; it should be given in addition to it. At the same time, if your receptionist is considerably increasing her salary she is simultaneously improving your business, not only the standard, but the turnover, and I have no doubt that all photographers who are not adopting this method up to now will give it their consideration, and will be agreeably surprised at the result, and nothing will give me greater pleasure than to know that my suggestion has been considered.

I am now about to prove my assertion by giving you a few figures, which represent sixty sitters taken during the time I had a qualified receptionist of many years' standing and from one of the leading studios in the British Isles before I adopted this idea of commission, and a further sixty sitters when I had another receptionist with considerably less experience but who worked on the commission system. The list which I have pleasure in placing before you will explain orders up to two guineas only, not above. The first item represents bookcards, which is a smaller size than postcards, in art covers, with a little sketch finish:—

Without commission:—

Bookcards.	Cabinets.	Panels.
51	6	3

With commission:—

Bookcards.	Cabinets.	Panels.
5	24	31
46 decrease.	18 increase.	28 increase.

I think these figures I have given you will convince you that the method is not a mythical one, and to see whether it had the same effect with other businesses as it had with mine I gave the idea to our friend, Mr. Bambrick, who has also been successful, and that gentleman will have pleasure in giving you an idea of his success during the last month only.

NEWTON BARRIE

PROFESSIONAL SHOW IN MANCHESTER.—The fourteenth annual show of "Everything Photographic" was held at 30, Chapel Street, Salford, Manchester, from January 6 to 17, at the premises of Messrs. Wahltuch, Smith and Co., Ltd. Considering the present abnormal conditions, the attendance of professional photographers from all parts of England and Scotland was distinctly good. A new "Universal" printer was shown, and consists of a well-designed light box for printing bromides, taking negatives from 15 x 12 downwards. By a simple switch five lights can be brought into action for use with gaslight papers, or for printing from a dense negative. The exposing switch is in the form of a footboard, pivoted so that pressure on one side brings on the "pilot" red light, and on the other side the white light. Arrangements are also made for quick insertion of the vignette. There was also a model of a new strip printer for six, on postcards, with automatic feed and change without the use of springs. The mechanism is extremely simple, and the printer can be easily worked by a one-armed assistant. Both machines are made by the company at their own works in Manchester. The bulk of the exhibits in the four showrooms were backgrounds of the latest designs, furniture and accessories, including many novel patterns suitable for studio and household use, all made by the company in Manchester. There were also daily demonstrations of printing on bromide and gaslight papers.

PHOTOGRAPHY'S WAR WORK.

[The immense part played by aerial photography in the prosecution of the war is naturally realised by photographers, a very large number of whom have been practically engaged in carrying it on. But perhaps the magnitude of the scale is not a matter of common knowledge, and therefore we embrace the opportunity of reprinting from the "Daily Telegraph" of Monday last an article which presumably embodies official figures. It is interesting to find that in the essential matters of cameras and lenses the British forces were better equipped than the German. The fact has recently been the subject of remark as regards lenses, and the writer of the notes printed below describes, it will be noticed, the same superiority in respect to cameras.—Eds. "B. J."]

When hostilities broke out in 1914 aerial photography was still in its primitive and experimental stage. A considerable amount of pioneer work had been done both from balloons and aeroplanes; a small but valuable literature was arising; but the impetus of war was required, with the aid of the immense scientific and technical resources behind the Royal Air Force, to exploit its possibilities. Some idea of the progress made can be gained from the fact that on the Western front alone during the last ten months of war no fewer than 264,605 Royal Air Force negatives were taken in the air over German territory, and the gigantic total of 5,800,000 prints was made from these negatives for the use of the Intelligence Staff.

The most recent types of Royal Air Force cameras are very highly finished pieces of work. The lens itself is shielded in a deep tube which faces vertically downwards, thus preventing direct sunlight falling upon it. At the other end of the camera is a steel chamber, containing the automatic device for changing the plates after each exposure. The entire apparatus is securely fastened to the side of the machine, and is connected by a wire with the observer's seat. The pressure of a lever is sufficient to expose a plate and to bring a new plate into position. The German cameras, as recently exhibited in the Strand, lack many of the exquisite mechanical refinements of the British instrument, particularly the ingenious device by which the plates are automatically changed in the air, without any attention whatever from the pilot. This striking British invention has enabled many excellent and valuable photographs to be taken while the machine itself has been under heavy fire both from the air and the ground.

High-Speed Photography.

Anyone who has tried to take a snapshot from the carriage window of an express train realises the difficulty experienced in obtaining a negative entirely free from movement. The same difficulties are, of course, experienced in taking photographs from the air. A modern aeroplane is really a travelling observation platform moving at from fifty to a hundred miles an hour. As the pace of the machine cannot be altered, the object to be taken must be "snapped" as it slips swiftly by beneath the machine. Aerial photography, is, therefore, high-speed photography of a special kind. An aerial photograph is almost always under-exposed, and this calls for exceptional treatment when the plates come to be developed. Apart from this peculiarity, however, it is the definite policy of the Royal Air Force to specialise in very thin negatives. A dense negative takes far too long to print by artificial light. A thin negative enables prints to be made in about three seconds. In this way a trained Royal Air Force photographer can print and develop as many as eighty separate enlargements in the course of an hour.

For this scientific work the Royal Air Force has trained large numbers of highly skilled workers. In the model dark-rooms at the Central School of Aerial Photography every candidate for acceptance as a R.A.F. photographer must first pass a severe test, designed to reveal his suitability or otherwise for the work. He is then given a month's practical intensive training, particular attention being paid to the processes of development, and to the enlargement of negatives by artificial light. Much importance is attached to the rapidity with which these enlargements can be produced, for the fate of a battle may depend upon the promptness with which large-scale copies of a vital subject can be supplied to the Intelligence Staff. After a further course at a training centre in England, the airman-photographer would proceed to a service squadron overseas, and be assigned to a photographic section working with a reconnaissance flight. Such a "section" usually consists of a technical non-commissioned officer and about seven men, who take in turns the more confined and laborious aspects of the work. One man will "load" the magazines with unexposed plates, another will fix the cameras to the machines prior to flight, and receive them on return; others are detailed for developing, washing, drying, and plotting the negatives. Several men are constantly engaged in the enlarging-room, exposing and developing as many as 100 prints in an hour.

Before an Offensive.

It is during the strenuous days preceding a big offensive that photographic activity rises to its maximum. During the successive big drives made by the British in France during the summer and autumn of last year, the entire field of operations was photographed over and over again. If a new series of enemy trenches were constructed during the night, a R.A.F. reconnaissance squadron would bring home photographic evidence of the fact on the following morning. It was no uncommon thing for as many as 11,000 negatives to be made on the Western front alone during a single week preceding an important advance.

In addition to this vast work of aerial reconnaissance, photography was also extensively used for verifying the results of artillery fire, and for recording the precise effects of bombs dropped from the air. The very striking photographs of Frankfort, Mannheim, Metz, Sablon, etc., recently published in the Press, were actually taken during the raids upon those towns. Another valuable development was the application of the stereoscope to war intelligence. By taking two photographs of the same object, say an enemy trench system, at an interval of a few seconds, a striking stereoscopic effect is obtained which throws all the ramparts and other elevated portions of the enemy work into high relief. In this way the principal difficulties to be encountered by the attacking party can be foreseen..

Aerial photography is destined to become one of the big new industries of the future. The topographical surveys of to-morrow will be photographic surveys; the school and commercial atlases will be photographic atlases. Exploration, commerce, scientific research must all benefit by an industry which may well grow to very large proportions. In this field of post-war industrial activity, Britain will inevitably take a foremost place, for she already has at her command in Royal Air Force personnel some of the most highly trained specialist photographers in the world.

Photo-Mechanical Notes.

Photo-Litho Negatives.

The making of negatives for litho purpose has become an important branch of modern lithography. The difficulty, however, is to obtain workers that are experts in this direction. Workers who intend specialising in this branch should possess or acquire a knowledge of lithography. They should be good photographers capable of using panchromatic as well as ordinary plates. They should understand the intelligent use of colour screens and be able to handle large-sized wet plates for line and half-tone negatives. Process half-tone negatives will not answer for lithography, as this type of negative records the original in a lower series of tones, which in the subsequent etching are raised to the tone of the original, this attainment often being aided by fine etching. In lithography no etching nor fine etching, as used in process work, can be employed; pure-whites on the original must be represented as such on the negative and the other tones in correct dot formation. When eliminating the dot effect in the whites the middle tones have a tendency to be raised, but provided the original is one suited for the process, this defect can generally be remedied. Flat or imperfect originals should be worked up by an artist who specialises in this work. This point is more important in lithography than in process engraving, as there is not as much latitude

possible when making negatives for litho as there is for process work; lost gradation cannot be recovered as when etching a half-tone plate.

The following different kinds of negatives are used in photo-lithography :—

1. Ordinary line negatives for black and white work.
2. Screen and grain negatives of the so-called high-light variety.
3. Continuous tone negatives from drawings, photographs, and coloured originals.

These negatives are for some purposes required to be laterally reversed, and other purposes taken direct.

The following list will show the requirement :—

Negatives for printing direct on metal	Reversed.
Negatives for printing on photo-litho paper and then proofing by offset	Reversed.
Negatives for collotype transfers to stone or metal...	Reversed.
Negatives for printing direct on metal and then proofing by offset	Direct.
Negatives for printing on photo-litho paper	Direct.
Negatives for making positives from which etched copper plates are made for transfer purposes	Direct.
Negatives for bromide prints	Direct.

When possible the wet-plate process is to be preferred for making photo-litho negatives, as complete opacity and transparency is easily obtained, and as most of the negatives required are usually of large size it is the cheaper method. Negatives must be free from stain, correctly exposed, and well fixed in fresh fixing solution. Excessive chemical reduction or intensification must be avoided, otherwise fine lines will be thickened and broad lines thinned and the character of the original lost. For good quality work the copper-silver intensification is best, for poster and course work the lead ferricyanide intensification is quite suitable and cheaper than the former. The negatives should be made on good quality glass of the same size, or if possible larger than the metal plate on which it is to be printed. If the negative is smaller the edges are likely to dent the litho plate when being printed in the pressure frame; the correct centreing of the image is very important. Dot or grain negatives are obtained by photographing the original through a half-tone or metzograph screen. The selection of the ruling or grain of the screen depends for what purpose the result is to be used. Screens of 50 to 80 for poster work, or metzograph screens 00 or 0; for finer work 80 to 120, or 1 to 2 grain screen. For posters of large size the dot in the middle tones may be an ¼ of an inch across, therefore it will be necessary to make a coarse screen negative and from this an enlarged positive, which is again enlarged when making the final negative. A suitable negative can sometimes be obtained, if the original is good, or if not, has been properly worked up by slightly increasing the screen distance and giving a full shadow exposure with a medium-sized stop and a high-light exposure with the largest stop possible; if the middle tones are raised, skilful reduction will generally restore them.

Another method recommended is to make the shadow or detail exposure, after which the dark-slide is removed from the camera and the screen taken out, and a piece of glass the same thickness as the screen substituted. The dark-slide is then replaced and an additional exposure made through a small stop; this exposure will fog in the high-lights and eliminate the dot effect. Great care must be exercised when removing the dark-slide and replacing, otherwise the sensitive plate will be shifted. Another popular method is to make a bright continuous-tone negative from the original. This negative is then illuminated by transmitted light, and from it is made a screen or grain positive in the camera. If properly exposed the high-lights will be without dot formation and the other tones show correct dot formation; from this screen positive a negative is made by contact or enlargement. The next method is to make a very contrasty-screen negative on a dry-plate; from this is made an enlarged positive by wet-plate. Any dot formation showing in the high-lights can be usually reduced away, and then if necessary the negative intensified. This screen positive can be printed on the metal plate direct by using the Vandyke process, which gives a positive from a positive, and therefore saves making another negative. This way of working is very useful for posters or screen work not exceeding 100 lines to the inch. Continuous tone negatives are used for various purposes in lithography and chromo-lithography. In chromo-lithography the colour key can be obtained by photographing the original through a suitable colour-screen on a panchromatic plate, it being important that all the detail is shown in the negative. From this negative is made a bromide print or enlargement the size of the production. The print must reproduce all detail without the lower tones being too dense; if too dense the artist will be unable to follow the detail in the tracing made from the bromide print on transparent tracing paper with black ink. The tracing is transferred to stone and proofs taken, which are dusted over with a special dye powder. Offsets are taken from these proofs on the stones used for the colour reproduction, and the artist can then draw in the different colours and detail in register.

Continuous tone negatives are used as a means of obtaining special grain effects, such as for the bitumen grain method, printing direct on the metal through a line or grain-screen in contact with the negative. The negative is sometimes specially treated by fixing or rolling a grain upon it. In the latter direction there are opportunities for experimental work, especially in securing a selective grain in the negative film by chemical or physical means.

The quality of the negative used for these different purposes depends upon the light by which it is to be printed. For daylight printing a good quality thin negative showing all detail; for open arc one showing more contrast; or enclosed arc one showing density coupled with detail. For large poster work, when enlargement is necessary, a lantern slide is made from the negative of the original, and projected to the required size upon a sheet or sheets of transfer paper held in a special frame. On this the artist outlines the detail, thus obtaining the transfer for the key outline. Sometimes large litho proofs are required for special advertising purposes from a set of tri-colour blocks. Proofs are taken of the blocks in good black ink on white enamel paper. From these proofs the enlarged negatives are made by the wet-plate process; the negatives obtained are printed on litho metal and proved in the usual tri-colour inks. Photography can supply the means of linking up lithography and machine gravure, gravure giving the general outline and foundation of the reproduction, lithography supplying the tints or colouring. The time may not be far distant when a gravure and offset machine will be seen running in tandem to secure artistic coloured reproduction of special quality.

It would be worth the process engravers considering the commencement of a special branch to supply lithographers not only with negatives, but transfers on paper, or prints direct on litho metal ready for proving, also suitable bromide prints or enlargements, or any item where photography is necessary, as the process engraver has all the apparatus for carrying out this type of work already at hand.

W. J. Smith.

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Applications, December 23 to January 11 :—

Trimmers.—No. 21,791. Apparatus for cutting or trimming photographs. J. Merrett and A. Thomas.

Cameras.—No. 36 and 37. Photographic cameras. A. and R. S. Ballantine and J. Lizars.

Trimmers.—No. 146. Apparatus for cutting or trimming photographic papers. F. Garrett and J. Merrett.

Cinematography.—No. 209. Cinematograph cameras and projectors. A. H. Oliver.

Cinematography.—No. 117. Protecting cinematograph films from fire. C. Page.

Cinematography.—No. 503. Cinematograph projector, shutter, and light-filter. E. R. Alexander and J. O. Wyndham.

Colour Photography.—No. 420. Method of taking and printing photographs in still life or cinematograph films in natural colours by means only of ordinary camera. W. Finnigan and R. Rodgers.

Lantern Screens.—No. 752. Screens for use with optical projection apparatus. R. J. Fox.

Colour Cinematography.—No. 665. Production of cinematograph colour pictures. A. D. Lacy and T. P. Middleton.

Washers.—No. 647. Apparatus for automatically and intermit-

tently filling with liquid and emptying photographic washers. F. W. Lawton.

CINEMATOGRAPHY.—No. 21,842. Stereoscopic cinematograph camera. W. Bennett.

CINEMATOGRAPHY.—No. 21,548. Production of cinematograph films by photo-mechanical printing. A. Hamburger.

CINEMATOGRAPHY.—No. 21,723. Shutters for cinematograph projectors. L. Kamm.

COMPLETE SPECIFICATIONS ACCEPTED.

These specifications are obtainable, price 6d. each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

EMULSION-COATING OF CELLULOID. No. 121,054 (Mar. 19, 1918).—The invention relates to the coating of one side of a film of celluloid with emulsion, and has for its primary object to enable the coating operation to be carried out in such manner as to ensure substantial uniformity in the thickness of the coating notwithstanding the fact of the film being in a buckled condition prior to the operation being carried out.

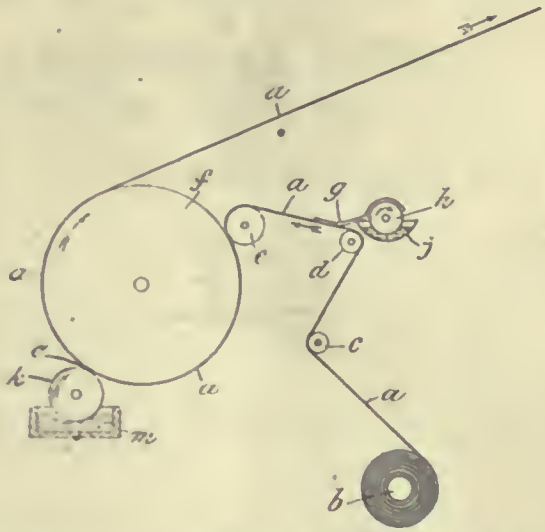
For the purpose of preventing buckling or curling of the film and to keep it perfectly flat and level whilst the coating thereon is in a fluid state, it has been proposed to moisten the under-surface of the film whilst passing over a plate after having received the coating of emulsion.

According to the present invention the back of the film is damped before the application of the emulsion and the film is forcibly pressed against a smooth and rigid cylindrical surface to which it is caused to remain evenly adherent by atmospheric pressure during the coating and setting stages of the process so that, the buckled portions continuing flattened out during these stages, uniformity of thickness in the layer of emulsion is ensured. When the now sensitised film is subsequently stripped from the surface against which it was adherent, any buckling of the film will not affect the uniformity of thickness in the coating.

For the purpose of effecting and maintaining temporary adhesion of the film to the smooth and rigid surface against which it is pressed, the back of the film, after being damped, is preferably rolled down upon the surface so that it remains uniformly and closely adherent thereto under atmospheric pressure as a result of the expulsion of the air from beneath those buckled portions of the film which would otherwise tend to rise from off the surface. The sensitised emulsion is applied hot, as usual, so as to be kept in a liquid state until the coating has been effected; whilst the surface against which the film is pressed is chilled in order to hasten the setting of the emulsion. When, after the coating of the emulsion has set, the sensitised film is stripped from the surface to which it was adherent, the back of the film becomes rapidly dried on exposure to the atmosphere.

In order that the process may be carried out continuously upon a film of considerable length such as is required for cinematographic purposes, the unsensitised film, as it is drawn from a spool, is led past a device whereby the back of the film is damped, and this damped surface of the film is thereupon forcibly pressed into contact with the periphery of a rotating cylindrical drum by means of a spring-loaded roller between which and the drum the film is caused to pass, so that, any buckled portions of the film being flattened out against the drum, the film remains closely adherent thereto under atmospheric pressure until subsequently stripped from the drum. Whilst thus flattened and adherent to the drum, with which the film is carried round, the film passes between the drum and a coating roller whereby a thin layer of emulsion, of uniform thickness, is applied hot to the outer surface of the film; the interior of the drum being kept chilled so as to effect the setting of the coating of emulsion within a predetermined period of time. After the application of the coating, the film is allowed to remain in contact with the surface of the rotating drum throughout a part of its circumference sufficient to allow the setting of the emulsion to take place; whereupon the film is stripped from the drum and led to a drying reel.

In the drawing the uncoated celluloid film *a*, initially wound upon a spool *b*, is drawn therefrom continuously over guide-rollers *c* and *d* to the pressure roller *e* between which and a rotary drum *f* of relatively large diameter the film is flattened out. Before reaching the pressure-roller *e*, the back of the film *a* passes beneath a wick *g* which is kept continuously moistened by contact with a rotating roller *h* dipping into a trough *j* containing water; the wick *g*, whereof the width corresponds to that of the film itself, wiping over the back of the film so as to leave a slight film of moisture thereon throughout its entire width. This dampened



surface of the film *a* contacts with the drum *f*, the pressure-roller *e* being spring-loaded in the direction of the axis of the drum so as to exert, against the surface of the drum, sufficient pressure to ensure that, as the film passes between the roller *e* and drum *f*, it will be forcibly flattened out against the latter, with the result that any air imprisoned between the outwardly-buckled portions of the film and the surface of the drum will be expelled so that, on passing clear of the pressure roller *e*, the film *a* will remain closely and solidly adherent to the drum *f* by atmospheric pressure alone.

The film *a*, whilst thus adherent to the drum, is carried round between the latter and a rotating roller *k* which, dipping into a trough *m* containing the emulsion, carries up and applies to the outer surface of the film a thin layer of the emulsion the thickness of which remains uniform owing to the fact that the film *a* continues flattened out against the drum. The drum *f* is chilled internally so as to cause the coating of emulsion on the film to set rapidly, and when the film, as it travels around the axis of the drum, reaches the point in the circumference of the latter whereat the setting is sufficiently advanced, the film is stripped off and led to the drying reel (not shown).

In the example illustrated, the pressure-roller *e* is situated high up on that side of the drum *f* at which the film *a* is applied to the surface of the drum, whilst the coating-roller *k* is situated low down on the opposite side of the drum, and is so driven that its periphery moves in the direction opposite to that in which the film travels. The surface of the roller *k* should be kept out of direct contact with the film *a*, but the emulsion carried up by this roller, nevertheless, forms at *o*, just beyond the line whereat the roller most closely approaches the film, a "pool" from which the film itself carries up with it a layer of emulsion whose thickness can be adjusted by regulating the distance between the periphery of the roller and the surface of the film.

The coating-roller *k* is so much shorter than the width of the film *a* that the layer of emulsion does not extend across the entire width of the film, it being desirable that a narrow margin of the film should be left uncoated at each side.

The point at which the film *a* is finally stripped from the drum *f* is, in the example illustrated, situated near the top of the latter. The film, when stripped from the drum, may again become buckled, but this will not affect the uniformity of thickness of the coating of emulsion.—Newton Livingstone Scott, Lauriston, Ashstead, Surrey.

LANTERN SCREENS. No. 121,499 (April 26, 1917).—A coating of finely divided particles of mica or quartz is given to the screen by employing a suitable size, medium or the like, so that it may

be applied by means of a brush; this greatly increases the quantity of light reflected from the portions illuminated without detracting from the effect of the shadows; it also reduces the amount of light required to illuminate the screen, adds depth and distance effect to the picture, and makes it possible to reproduce on the screen the brilliancy of natural sunshine and other lighting effects.—CHARLES FREDERICK KIRBY, Oakhurst, 57, Ashbourne Road, Derby.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

SATURDAY, JANUARY 25.

Huddersfield Naturalist and Photographic Society. Lantern Lecture, "Woodsome and its Surroundings." W. H. Sikes.

MONDAY, JANUARY 27.

Bradford Photographic Society. Members' Night: "Transferotype." W. H. Hammond. "Hints and Dodges" by other members.
City of London and Cripplegate Photographic Society. "The Negative." W. Slater.
Dewsbury Photographic Society. Lantern Lecture. W. T. Audsley.

TUESDAY, JANUARY 28.

Royal Photographic Society. Presidential Address, Dr. C. Atkin Swan.
Halifax Scientific Society (Photographic Section). Members Slides. Criticism by members.
Leith Amateur Photographic Association. Slides due for Lantern Slide Competition. Open meeting.
Hackney Photographic Society. "The Evening Hour." (Prints.)
Manchester Amateur Photographic Society. Annual Meeting.
Chelsea Photographic Society. Demonstration: "Combination Printing." B. C. Wickison.

WEDNESDAY, JANUARY 29.

Croydon Camera Club. Annual General Meeting.
Ilford Photographic Society. "Highways and Byways of Essex." G. U. Heslam.
Dennistoun Amateur Photographic Association. "Hints on Portraiture." W. Foulds.

THURSDAY, JANUARY 30.

Brighouse Photographic Society. Y.P.U. Lantern Slides.
Hammersmith (Hampshire House) Photographic Society. "Some Leaves from Nature's Book." W. Benington.
Hull Photographic Society. Kodak "Transferotype" Process, and Ilford "Intona" P.O.P. Demonstration.
Rodley and District Photographic Society. Members' Night.
Liverpool Amateur Photographic Association. "Pictures of Egypt." A. Keighley.
Chelsea Photographic Society. Dark Room.
Wimbledon Camera Club. A. P. and P. Prize Slides, and Criticism.

CROYDON CAMERA CLUB.

MR. F. ACKROYD gave a third chapter of "Travellers' Samples" last week, these being lantern-slides from negatives taken on tours at home and abroad. It is not everyone who can rummage through an old stock of negatives and thrice utilise them for chatty lectures, but then everyone is not gifted with Mr. Ackroyd's powers of observation, or possessed of his happy knack of investing even an ordinary subject with humour and interest.

For years he has held an unchallenged position in the club for the production of slides deserving of the highest admiration so far as relates to his wonderful nerve in showing them, and on this occasion, remembering past errors of judgment on the part of his audience, he kindly said that those considered by him to be pictorial would be so notified in advance. This removed much mental strain, and put all in a comfortable state of mind from the start.

In the preliminary canter some slides made from picture-postcards were of interest as showing the deplorable state this industry must have reached. Of interest also were some slides due to a friend who had adopted the novel plan of affixing the indicating discs in the sky—a boon to the lanternist, as the right way up would be seen at a glance. Credit should also be given Mr. Ackroyd (or his friend) for the nice feeling displayed in obliterating pinholes, a monument being erected to each departed.

Half-way through the lecture, when restoratives had vanished under the 9.30 p.m. rules, and all that remained was some non-alcoholic ginger wine which had undergone secondary teetotal reactions imparting a most disturbing flavour, members received a rude shock, for a slide technically and pictorially good suddenly appeared on the screen. After a short pause of petrified astonishment tumultous applause broke forth, to be renewed when others of the same kind followed. Members who really should have known better got up and warmly congratulated him on the advance made. Advance, indeed! Good slides are not so difficult to produce, but those hitherto characteristic of the lecturer were absolutely unique, plumbing depths unknown to the common ruck, and it is sad to think such may never be seen again. A most hearty vote of thanks was accorded him for an evening in lighter vein altogether delightful.

EDINBURGH SOCIETY OF PROFESSIONAL PHOTOGRAPHERS.

THE fourth meeting of the session was held on Monday, January 13. Mr. Drummond Young, who was in the chair, read a letter from the Secretary of the Edinburgh College of Art intimating that the Board were prepared to meet the retouching class committee of the society to discuss the forming of the class, and arranging for a meeting on the following day, Tuesday, 14th.

The Chairman proposed that a committee might now be formed to investigate the details and costs of a co-operative printing-room on the lines previously discussed, but it was decided that this matter should still be allowed to lie. A committee, however, consisting of the chairman, Mr. George Balmain, and Mr. Johnston, was appointed for the purpose of inquiring into the details necessary for the arrangement of a professional exhibition in Edinburgh.

Mr. Johnston intimated that he had received a sample of plates from the co-operative plate factory, and, so far as he had tried them, had found them quite satisfactory. He promised to report further after having used the remainder.

Mr. Barrie then delivered a paper entitled "Some Facts and Figures on a Method of Increasing Business" (referring to postcard and small work). The paper dealt with a system of giving a small commission to receptionists on all orders booked above a certain value; and he proceeded to show some very interesting figures. Mr. Bambrick warmly approved of the scheme, and quoted his personal experience of it during the previous month, since when, on Mr. Barrie's suggestion, he had adopted the system. A very interesting discussion then followed. Mr. Campbell Harper pointed out that while such a system was of great utility in those businesses where the postcard formed only a part of the turnover, it was scarcely practicable for these firms in which the postcard was the mainstay. He explained that not only was it very difficult to deal with customers individually on busy Saturday afternoons in an endeavour to sell them better styles of work, but that those classes of the community who had limited spending powers would not, and could not, be induced to alter their firm determination to have "postcards" and nothing else. Sympathy was expressed from this point of view, but Mr. Barrie felt sure that, even under such conditions, something might be done by his system.

A point was raised as to whether photographers should supply customers with postcards made from negatives of a cabinet sitting. It was generally felt that this could not be avoided.

Mr. Barrie was heartily thanked for his interesting and instructive address.

It was arranged that at the next meeting a discussion should take place on the fixing of a minimum price for postcards, and it was moved that all Edinburgh photographers should be invited. Arrangements for this summer's holiday closing scheme would be made at the same meeting. The meeting then closed.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.—The members were recently conducted over the works of the Realistic Travels, of 73, Warwick Gardens, W. Mr. H. Creighton Beckett, who had extended the invitation, explained in detail, the production of stereoscopic pictures. He demonstrated strip printing and quick development, and stated his record so far as enlarging was concerned is 100 enlargements printed and developed in an hour. One of the most ingenious items was a four-sided print cutter. The prints were passed through, a handle was pulled down, and the print was trimmed all round in one operation. Labour-saving devices were numerous, but these seemed in no way to have had any detrimental effect upon the class of work turned out. In fact, it seemed that the less the pictures were handled the better the final result, and the results were exceptionally fine, both in tone and style. Much of the work turned out by the Realistic Travels bears the stamp, "Crown Copyright," and deals with the war. It is stated that great interest is being taken in the colonies in the stereoscope as a means of education; and certainly the idea is a commendable one, as some of the pictures explain more at a glance than could be conveyed by columns of printed matter.

Commercial & Legal Intelligence.

A Photographer's Affairs.—At the London Bankruptcy Court last week, before Mr. Registrar Francke, the public examination was appointed to be held of Harold Aylmer Jones, photographer, lately carrying on business at 30, Hill Street, Richmond; but upon the case being called on for hearing the Official Receiver asked for an adjournment, as debtor had not yet filed his statement of affairs, and he had experienced considerable difficulty in getting him to keep appointments. The debtor formerly carried on business at Richmond under the style of the Castle Studios. He purchased the business for £23 from a Mr. Harwood, paying the purchase money by instalments. He had also carried on business at the South Kensington Studios, 7, Gloucester Terrace, W., but the business was unprofitable, and necessitated his resorting to money-lenders, one of whom sued him and sold him up. He estimated his liabilities at about £300, and alleged his failure to have been caused through loss on trading owing to domestic differences with his wife, who had obtained judgment against him for arrears of maintenance under an order of the Court. The learned Registrar adjourned the examination until February 14, and ordered debtor to file his statement of affairs within a fortnight.

Application for Discharge.—John Page Croft, lately carrying on business at 24, Quadrant Chambers, New Street, Birmingham, made an application for his discharge at the Birmingham County Court, before His Honour Judge Amphlett, on Thursday last. The Official Receiver reported that the receiving order was made in February, 1908. The bankrupt's liabilities were then stated to be £2,323 9s. 8d., and assets were given at £12 10s., but they realised only £1 14s. 3d. In the joint estate of the Page Croft Paper Co., bankrupt's liabilities were £431 12s. 1d., and the assets were stated to be worth £139 3s. 3d., but realised only £36 13s. 3d. No dividend had been paid. The bankrupt, said the Official Receiver, was fifty six years old, and for ten years prior to the receiving order being made was a tea agent, earning at one time as much as £1,200 a year. For the three years, however, prior to the order his income had been only £200 a year. Bankrupt had lost money by gambling in cycle shares, and a tea business with which he was connected was also a failure. He was greatly interested in photography, being a successful exhibitor and a lecturer, and he obtained several considerable sums of money to exploit a new photographic paper, which it was thought would revolutionise photography in this particular direction. This photographic paper business was also a failure, and the Official Receiver described this as a rash and hazardous speculation when bankrupt was already financially involved.

Mr. G. A. Barton, for the applicant, explained that, owing to a rearrangement of the districts, bankrupt's income at one swoop was reduced from £1,200 to about £200 a year. He naturally, therefore, endeavoured to increase his income. He was looked upon as an authority on photography, and his paper experiments were regarded so favourably that he had no difficulty in raising money to make the paper. Unfortunately bankrupt did not meet with success in this enterprise. His position had now slightly improved, and he was earning from £400 to £450 a year. His friends were willing to find a sum of £500 within three weeks to divide among the creditors.—The Official Receiver said he would accept the offer. His Honour, in giving judgment to this effect, said applicant had been unfortunate, no doubt, although somewhat reckless.

The Late Mr. Harry J. B. Wills.—The death has occurred at his residence, 43, St. Helen's Road, Swansea, of Mr. Harry J. B. Wills, who for many years carried on a photographer's business at 22 Morgan Arcade, Cardiff. He is survived by a widow and family.

Co-operative Plate Works, Ltd.—At an extraordinary general meeting of the Co-operative Plate Works, Ltd., held at the offices of Messrs. E. C. Rawlings, Butt and Bowyer, 2, Walbrook, London, E.C., on Wednesday, January 15 last, the following resolution was passed:—"That it has been proved to the satisfaction of this meeting that the society cannot by reason of its liabilities continue its business, and that it is advisable to wind up the same, and accordingly that the society be wound up voluntarily, and that Anthony Bell, of 2, Walbrook, in the City of London, be and he is hereby appointed liquidator for the porposes of such winding up."

Correspondence.

**** Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

**** We do not undertake responsibility for the opinions expressed by our correspondents.*

EARLY CHAPTERS OF PHOTOGRAPHIC HISTORY.

To the Editors.

Gentlemen,—In his address to the Croydon Camera Club, Mr. Mackie omitted to point out that from the consecutive positions of the letters π (Pi) ρ (Rho) in their alphabet, the Greeks evidently knew something of development.—Yours faithfully,

Annie Myers.

THE ASSISTANT QUESTION.

To the Editors.

Gentlemen,—I think that an educational governing body for assistants would be very beneficial, and now that Mr. Marcus Adams has so admirably taken up the cudgel, I am sure everyone concerned will consider it a responsibility and voice their opinions.

We know that portrait photography is an art governed by science, and that before art develops technicalities have to be mastered, but I think photography is a profession in which proficiency is reached by laborious shuffling, both by masters and assistants. Apprentices are, in many cases, shamefully treated, because the photographer himself had to "pick it up," and consequently leaves his imitators to do the same. We lack practical art-science education. If an apprentice attends an Art School he is not taught anything practical; drawing from the antique with stumps and chalk does not foster the technique of working upon a photographic surface with a wet point; he is not shown the artistic anatomical draughtsmanship which governs the process of retouching. Consequently few retouchers have the knowledge of the construction of the head to guide them, but only a vague idea of rounded surfaces with accidental bumps. Hand in hand with a governing body we need an established system of education to facilitate at least some standard of efficiency.

In conducting a class at a Municipal College for professional assistants, I find the students industrious and keen, with feeble encouragement from photographers for them.—Yours faithfully.

George Coleman

The Lodge, Richmond Park Road, Bournemouth.

To the Editors.

Gentlemen,—My sincere thanks to all who have so kindly replied to the assistant question. A few of the letters contain much matter of great interest, but I regret to say I cannot at present find a satisfactory method of dealing with the seriousness of the question. All must admit the loose methods applied at the present moment; in fact, they are almost as impossible as they are unsatisfactory.

Judging from the letters, the assistants blame the masters for the careless way in which they are trained; this, of course, is too true in many cases, fortunately not in all. My personal opinion is that masters ought to stimulate the apprentice and assistant to be always on the look out to pick up information and cultivate the keener desire for education; and until the masters realise their responsibility to the assistant and to the profession of photography the alteration will not take effect.

And I am sorry to say I really believe that many masters don't care, and treat the matter with utter indifference. I can assure my fellow-workers that we shall have to face the matter with a determination that will prove satisfactory to the assistants and ourselves, or we shall find ourselves up against difficulties far greater than we see at present. It is to our advantage to organise and form a system without delay.

My suggestion is immediately to compile a complete register of all assistants, with information useful to both parties in case of change of situation, and as far as possible give the record of the assistant.

As soon as this is accomplished the governing body can deal with many important questions, such as the education by post, etc.

Who this governing body shall be is difficult to say; all I feel is the matter is urgent and important.—Yours very sincerely,

Marcus Adams.

Answers to Correspondents.

SPECIAL NOTICE.

In consequence of general reduced supplies of paper, as the result of prohibition of the importation of much wood pulp and grass a smaller space will be available until further notice for replies to correspondents.

Moreover, we will answer by post if stamped and addressed envelope is enclosed for reply: 5-cent. International Coupon, from readers abroad.

The full questions and answers will be printed only in the case of inquiries of general interest.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

T A. E.—The Ministry of Munitions. The address was as follows: Director of Optical and Glassware Munitions, 117, Piccadilly, London, W.

W. H.—The address of the glass firm is Messrs. James Hetley and Sons, Soho Square, London, W.1. The cinematograph apparatus firm is now known as the Tyler Film Company, of 13, Gerrard Street, Soho, W.1.

J. H.—Albumenized paper is not now on the market, and your only chance of obtaining it is, perhaps, by advertising. Possibly there are one or two people who have a small stock of the paper they would be ready to dispose of.

W. B.—The bust in question was purchased of Daniele Landi, 36, Charles Street, Hatton Garden, E.C. If you write to him he will doubtless quote a price, including packing and carriage, which will probably exceed the cost of the bust itself, which was 5s. Ask for the head of Gibson's Venus.

A. C.—We cannot assign any reason from the facts stated for the yellow stain. If your water supply is clear and colourless, and remains so on boiling, we do not think it can be the cause. We should say that persistent staining of this kind is a matter which you require to take up with the makers of the paper.

G. S.—We quite think there should be a demand for the dishes treated with your solution. Your best plan would be to make a few samples and submit them, with price per dozen, to some of the larger dealers. We do not much trust any wooden vessel without a lining, as it is easy to start a joint with rough usage.

A. W.—We regret we are unable to answer your queries without further particulars, viz. (1) What class of negatives do you wish to make—landscape, portraits, or copies—and what size plate do you wish to use? (2) What size of miniature, and whether the negatives are to be direct from life or copies? If you will furnish these particulars we will try to advise you.

Miss E. E.—Deep yellow pyro stain is by no means easy to remove. The best advice we can give you is to buy a preparation sold by the Vanguard Company, Maidenhead, and very effective in removing pyro stain. It is compounded from a bleaching powder, but we think you would do better to buy a preparation of this sort ready made than to make it up yourself.

C. E.—Your lens is evidently a cheap rapid rectilinear, and may be of decent quality; it is suitable for nearly all purposes, but rather slow for portraiture. The Planiscope shortens the focal length and includes more subject on the plate. You can use the lens either with or without the Planiscope in the enlarger either for enlarging or reducing. We cannot give the value, but the two are probably worth about 20s. or 25s.

J. B.—We are sorry that we have no list to which we can refer for the Rodenstock lens. As far as we can recollect, it was not corrected for chromatic aberration, and had a sliding adjustment to allow of a correction being made after focussing. We can only advise you to decide by actual trial whether the lens is likely to be of any value in your special work. Certainly do not buy any lens which you cannot have on appro.

L. L.—Retouching is a subject which cannot be taught satisfactorily by means of a book. Some people who have a natural aptness for the work manage to get on with the help of printed or written instructions, but from your letter we should judge that nothing but personal teaching will be of any use to you. We do not propose to deal with retouching in the present Practicus series; even if we inserted diagrams they would be of little value, because so much of the quality of the work is lost in reproduction.

Introducing Figure into Groups.—Could you kindly inform me the best way to insert a photograph of one person in a family group? The family group I have just taken is minus one son, who was killed in the war; hence the request for his photograph to be inserted.—G. S.

It is difficult to give in the limits of a letter working details of the operation you wish to perform. The simplest way is to make an enlargement of the group, then to enlarge the single figure in proportion, cut it out, and paste it on the group, then work up the whole if necessary and make a copy negative the desired size, taking care to avoid a shadow of the cut edge of the figure. This is the plan generally adopted, and you are more likely to make a job than by double printing direct from the two negatives, which requires much practice.

Royal Photographic Society.—Dr. C. Atkin Swan's presidential address, arranged for Tuesday last, has been postponed owing to the bereavement in the Royal Family. Dr. Swan will deliver his lecture on Tuesday, the 28th inst., in place of that announced to be given by Mr. E. W. Mellor.

Society of Master Photographers.—A committee meeting of the society will be held at the Manchester Chess Club, 65, Market Street, Manchester, on Tuesday, January 28, at 4 o'clock. Applications for membership should be addressed to the hon. sec., F. Read, 14, Balfour Road, Southport.

The British Journal of Photography.

The Oldest Photographic Journal in the World.

PUBLISHED EVERY FRIDAY. Established 1854. **PRICE TWOPENCE**

TERMS OF SUBSCRIPTION, POST FREE.

United Kingdom.—One Year, 10s. 10d.; Six Months, 5s. 5d Three Months, 2s. 9d.

Canada ... ... Australia ... ... New Zealand ... ... South Africa ... ... United States of America South America ... ... India and Far East ... ... Continent of Europe ...	*One Year.* Thirteen shillings (13s.), or 3 dollars 17 cents, or 16 francs 38 cents, or 6 roubles 15 copecks, or 9 rupees 12 annas, or 6 yens 30 sens.
Federated Malay States, Borneo and Sarawak	5 dollars 57 cents.

Henry Greenwood & Co., Ltd., Proprietors and Publishers, 24, Wellington Street, London, W.C.2.

IMPORTANT NOTICE TO READERS.—Until further notice agents will supply the "B. J." to order only, as the acceptance of "returns" by a publisher is now prohibited by the Government. It is therefore necessary in order to ensure the regular delivery of the "B. J." each week to place an order definitely with a dealer, newsagent or bookstall clerk, or to send a subscription to the publishers.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3065. Vol. LXVI. FRIDAY, JANUARY 31, 1919. Price Twopence.

Contents.

	Page
Ex Cathedra	45
Some Notes on Print-Meters	46
A New Yellow Dye and Light-Filters Made From It. By C. E. K. Mees and H. T. Clarke	48
Practicus in the Studio. By Practicus	49
The Gum Bichromate Process with a New Colloid. By H. S. Stokes	50
Dark Slides Out of Register	51
Meetings of Societies	52
Forthcoming Exhibitions	53
Commercial and Legal Intelligence	53
News and Notes	54
Correspondence— Are Materials Prices to Fall Soon? — British Gelatine Lens Repairs: A Warning— The Assistant Question	54
Answers to Correspondents	56

The Summary of contents which usually occupies the lower half of this column will be found at the foot of the page overleaf and will continue to be placed there whilst its regular position is required for notices relating to the forthcoming "B.J. Almanac."

Publication.

We are now at last able to announce the date on which the 1919 Almanac will be on sale. Our publishers tell us that unless something entirely unforeseen occurs to prevent it the books will be obtainable from dealers and booksellers throughout the country who have ordered copies on Thursday, February 6. In London, owing to the large area over which copies have to be delivered, there may, of course, be differences in the time at which the Almanac can be procured. We have not yet arrived at the point at which goods can be deposited at salesmen's doors with ten times the accustomed rapidity from aircraft, but it is possible to say that on Thursday, February 6, the homeward bound Londoner will be able to get his Almanac from his customary dealer. That, of course, supposes that the dealer has ordered copies—and ordered them in time. As has been already pointed out in these notes the distribution of this year's Almanac has perforce been done upon the principle of "first come, first served." Certain dealers have been too late, and, as a consequence, their regular customers must go elsewhere.

And it should also be said for the information of individual purchasers who have not specially ordered copies that by far the greater portion of the edition of the Almanac is now ordered by retailers strictly on the basis of the requests in advance which they receive from their customers, and that therefore the margin which is available for chance sales is very small.

It is therefore necessary to advise the late individual purchaser that he should lose no time, if he wants to get a copy, in applying to his dealer. We hope that by the time the successor to the present Almanac comes to be published it will be unnecessary to devote space in this column to the reiteration of cautions, the necessity of which arises from the limited edition which has been imposed upon our publishers. Of the 1920 Almanac, if events shape as they should, there should be enough and to spare.

EX CATHEDRA.

Ghost Images or Flare. It is a known fact that many of the finest pre-war anastigmats frequently give both ghost images and flare when dealing with subjects which throw a strong light into their glasses. The defect is much less often met when single lenses or the single components of convertible anastigmats or R.R instruments are employed. "Ghost images" or "flare" are regarded by many photographers as being the more likely with instruments having many glass-to-air surfaces, and as a matter of fact, though not as a general rule, the more of these surfaces there are in the instrument the more likely is the defect to be in evidence in certain classes of work. It is not realised as well as it might be by those who possess anastigmats which exhibit flare or ghost images that much may be done to assist in eliminating these if the instrument is provided with a sufficiently deep hood. We have in our own possession an anastigmat with no less than ten glass-to-air surfaces, and invariably when this lens is used against the light or under like conditions the defects are sure to manifest themselves, yet when the front glass is shaded with a deep and efficient hood we have never had the least reason for complaint. The rarity of ghost images or flare when R.R. or single lenses are used may be traced in part to the fact that with the former class the hoods are much more efficient; as regards the latter, when the single components of the convertible anastigmat are employed it is nearly always the front lens that is removed, and thus the mount of the lens serves as a highly efficient hood for the back glass.

* * *

Camera Copies. The recent installation of the Photostat at the Patent Office brings forward the subject of quick and cheap copying of documents, printed matter, or drawings, by means of the camera. As most of our readers are aware in this and similar apparatus, the print is made by exposing bromide paper in a special camera which is scaled to various sizes. The image is normally a negative one, although positives may be made by recopying them same size. Taken in an ordinary camera the images would be laterally inverted, but this can be obviated by fitting a reversing prism or mirror to the lens, the latter being, of course, much the cheaper arrangement. We think that photographers who work for engineering and other manufacturing firms would do well to take this class of work into consideration, as it would secure many orders for copies of drawings, plans, etc., not amenable to duplication by the usual heliographic methods, which call for a translucent original. It should not be difficult to arrange an attachment to any ordinary large camera for moderate-sized subjects, while larger ones could be managed by taking a small negative and enlarging in the

usual way. We have seen some excellent copies up to three feet across made in this way, and as the work is practically mechanical, highly-skilled labour is not necessary. One point is essential, and that is that the same lens should be used both for making the negative and the enlargement. The operation has been very successfully carried out thus: supposing an architect's drawing has to be reproduced, a copy is made upon a process-plate, say, half-plate or whole-plate size, the distances between lens and original and lens and plate being accurately measured. The lens is then transferred to the enlarger, and the negative and bromide paper carefully placed at exactly the same distances, the result being a full-sized copy free from any distortion, the image having been made to travel back through the same optical system by which it was produced. Where much work has to be done it would be well to have both camera and enlarger rigidly set to the required points so that for full-sized reproductions no setting would be necessary. With a proper artificial lighting scheme the exposures of both plate and enlargement would be a fixed quantity, and a spoiled sheet almost unknown.

* * *

The Shop Window. A few days ago we were asked whether it was advisable to retain a shop window for the display of specimens or to be satisfied with show-cases in a lobby and let off the shop. This is not quite such a simple question to answer as it appears at first sight, since many factors have to be taken into consideration. The first of these is the class of business which is intended to be done. The highest class of portraitists depend almost entirely upon introductions, and to a lesser degree upon reproductions of their pictures in the press. Some go no farther than a brass door-plate to advertise their locale, a few even dispense with this, while others have modest show-cases with only one or two specimens on view at a time. A few of the older firms have large lobby shows or shop windows, but it is not until we reach those who cater mainly for chance trade that we find the window show really popular. Recently there has been a great increase in these window shows in London and other large centres, so that we must conclude that they have been found to be a paying proposition. It may be noted that many of the large portrait shops are being run by people who are also engaged in other branches of industry, and they have treated photographs in the same way as they would clothes, jewellery, or tobacco. Surely, therefore, it is quite in order for the photographer, pure and simple, to take a leaf from the business man's book and to go in for bold advertisement, providing that he has the means to do it properly, and not to lose sight of the next important factor in the matter—that of locality. To be effective a window display must be situated where there is a considerable amount of traffic, and in what may be called a shopping or market thoroughfare, where there are other attractions. Even in the same street one position is valuable and another almost worthless. In nearly every important thoroughfare there is one side which is much better for business than the other, and this the keen business man is careful to ascertain before he invests his money.

SOME NOTES ON PRINT-METERS.

Of the many forms of print-meters, or actinometers, the type dependent upon miniature negatives of graduated density is preferred by some, as no matching of tint is required, and for occasional work with only a few frames exposed it certainly is convenient. On the other hand, the most accurate of all probably is the "single-tint" tint-matching type, almost essential when many frames have to be kept going and taken in and out during the day's work, but it requires constant inspection, and if one tint is over-done accidentally only a rough estimate is possible to compensate for the over-printing. Single-tint meters, such as Johnson's, supplied by the Autotype Company, are provided with a roll of P.O.P., which under varying atmospheric conditions does not always make a good match with the surrounding tint, the yellow glass above necessarily being of insufficient depth to remove colour contrast. Greater accuracy in reading is secured by not attempting to effect a colour match, but to work in the following way:—If the nearest *edge* of the rectangular aperture is viewed obliquely from a fair distance with the eyes partially closed, it will initially stand out lighter than the darkening silver paper beyond it, and at a certain stage will merge into the tint and be lost, which point is taken as "one tint." Tests have shown that this method largely eliminates the personal equation, one printer, practically speaking, registering the same number of tints as another, whereas in the case of colour matching by gazing directly downwards on the meter wide differences in the estimation of what constitutes a tint have been found. A variant of "Johnson's" is the circular meter with disc refills; it is cheaper, but for professional use the former is the better. In some cases cellu-

SUMMARY.

In a leading article reviewing some of the types of actinometer or print-meter we describe how an instrument of the multiple negative type can be very readily made. (P. 46.)

This week's article by "Practicus" on studio work deals with the question of obtaining correct exposures in the studio, and sets forth a system of testing to be adopted in relation to the character of the result which is required. (P. 49.)

The formulæ and methods employed by Mr. H. S. Starnes, and recently described before the Royal Photographic Society for a modified process of gum-bichromate are given on page 50.

The properties of a new filter dye, Eastman yellow, are described in a communication from the Eastman Research Laboratory by Drs. C. E. K. Mees and H. T. Clarke. The new dye appears to be an entirely distinct substance from the filter yellow hitherto made by the Germans. (P. 48.)

A short note by Mr. W. E. Debenham contains a caution on the possible fault of register in dark-slides, and describes a readily applied method of testing for any error of register. (P. 51.)

A caution as to the repair of lenses and a further discussion of the assistant question, on which a long letter is sent by Mr. Frank Brown of Leicester, are features of this week's "Correspondence." (P. 55.)

In a report of a council meeting of the Professional Photographers' Association it is mentioned that the trades exhibition annually organised in pre-war days by Mr. Arthur C. Brookes will not be held this year, but that it is Mr. Brookes's intention to hold it in 1920. (P. 52.)

The presidential address before the Royal Photographic Society, delivered by Dr. Atkin Swan on Tuesday evening last, dealt largely with the domestic politics of the Society. (P. 53.)

Photographers in Belfast dependent on electric supply have found themselves unable to continue business as the result of the industrial strike. (P. 53).

The choice and valuation of studio lenses, cleaning of film from old negatives, use of half-watt lamps, and colouring of prints are subjects on which brief replies are given to correspondents. (P. 56.)

The occurrence of ghost and flare images can often be avoided by the use of an efficient hood on the lens. (P. 45.)

For many purposes a permanent copying installation may be found of commercial value. We describe a method of avoiding any possible distortion from the lens in making copies of plans, etc. (P. 46.)

The shop window is now a much more important consideration in the business of a photographer, and calls for a very careful judgment in the choice of a business position. (P. 46.)

loid is used to protect the tint, but it is an indifferent substitute.

To insure accuracy with thin or medium negatives, the meter should register three or four tints during the printing, accuracy being of more importance when printing platinotype or palladiotype by meter than with the carbon process, which has greater latitude in exposure, or, rather, errors in exposure are more readily corrected in development. But a quick-printing single-tint meter is a decided nuisance when dense negatives are being dealt with, and in such a case a fixed-out lantern plate dyed yellow with bound-on cover-glass can be placed over the meter and will be found very useful to slow down its indications. As a matter of curiosity, it may be mentioned that the extreme variation in the rate of contact printing met with in one trade printing concern ranged from three minutes to twenty hours, the negatives being exposed to the same

Fig.

mercury light, and each negative affording good prints. The perpetrator of the twenty-hour gem had "faithfully promised his customer a dozen prints at the end of the week," as is usual in such cases

Other forms of print-meters based on tint-matching are illustrated by "Sawyer's" and the "Akuret," the sensitive paper being exposed under translucent tints of different densities. They possess an advantage over the single-tint type, as no movement of the paper is required whilst the negatives are being printed, but their scope is not so wide. The familiar Wynne's meter, dependent upon numbers successively printing out, is a favourite with many, though others experience a difficulty in deciding whether any particular number has, or has not, appeared Finally, the type first alluded to is the device of Mr. H. J. Burton, on the lines of which the making of an efficient home-made article is to be described.

Not a few have attempted to make print-meters of the graduated miniature negative order, by copying a photograph in the camera, or by exposing by contact a dry-plate behind a positive, in either case successively on different parts of the plate, with an increased time of exposure for each small negative, but this method is very uncertain, and the results are usually far from satisfactory for fairly obvious reasons. It is also obvious, when mentioned, that to attempt to design a meter capable of indicating exposures from thin negatives up to those of extreme density, either means an undesirable multiplication of the tiny guide negatives, or an equally undesirable abruptness in the translation from one to another. For unnaturally dense negatives, one or more pieces of ground-glass placed over the meter will meet the case.

Fig. 1 represents a quarter-plate negative of nine prints stuck on white cardboard, which are reduced by copying in the camera to a little less than 2½ inches high over all, in position shown on the plate. The prints should be of the same subject, preferably a portrait rather large on the plate, and whilst it is an advantage that the set be uniformly lit, even illumination is not essential. Over-exposure is to be avoided as bright, but fast printing negatives with almost clear glass shadows are the most suitable. If the ground prints through it is blocked out.

Assuming the figure to represent the glass side of the plate, and the negatives to read from left to right in the usual way, the graduation in printing rate is effected by covering No. 2 with one layer of celluloid, about the thickness of that used for cut films, No. 3 with two layers, and so on. Fig. 2 shows the first sheet of celluloid applied with extremities extending beyond the miniature negatives,

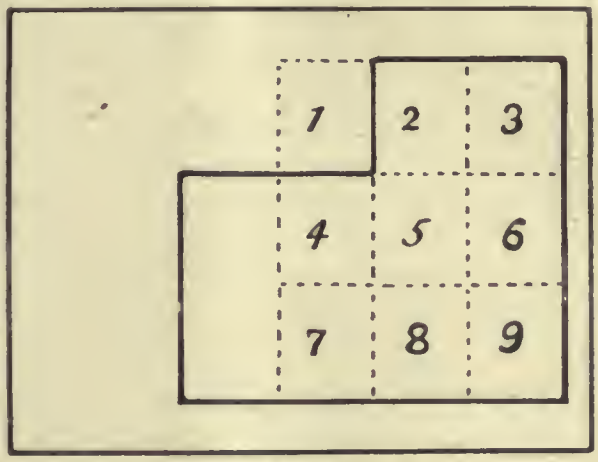


Fig. 2.

but clear of the edges of the glass; on the right about ⅛th inch, on the other three sides more space is available. The next sheet has space 2 cut away, and is stuck down at each end with a touch of celluloid varnish, the procedure being continued *mutatis mutandis* until No. 9 is covered with eight thicknesses.

When the first test of the meter is made everything may appear right, the lower numbers being nicely graded, and on printing further the faint images of the highest numbers apparently the same. But here exists an unsuspected trap, for on printing, say, No. 5, to the "pretty" stage, No. 6 may now be found to be almost indistinguishable in depth, and therefore require further holding back, together with the numbers following it.

Accordingly, the only safe plan is to test each number right through the series at its "pretty" stage against the next less printed one. Some pieces of stripped thin roll-film may be found of service when only a very slight holding back is demanded. The celluloid covering is then edged all round with cardboard slips stuck down with seccotine, and a thin cover-glass bound on. If the lower numbers print too quickly for the negatives in use, the cover-glass may be of ground-glass. A three-quarter-view quarter-plate printing-frame holds the finished article; white wood frames are sold sufficiently deep to take it. A packet of 3½ × 2½ ordinary gelatine P.O.P. provides the meter paper, and will keep for years if stored in an air-tight tin with some dry calcium chloride. Self-toning papers are not so good for the purpose. When the number indicating the correct exposure is found by trial, naturally only a narrow strip of paper need be utilised afterwards.

In the model constructed, which has worked well, for

identical depths of printing the last number requires about six times the exposures of the first, a range sufficient to satisfy most requirements. This ratio, of course, only holds good for the particular thickness of celluloid employed. Comparative values might be given each negative if a single-tint meter is at hand, or improvised, by registering the number of tints necessary to bring each negative in turn to the pretty stage.

A NEW YELLOW DYE AND LIGHT-FILTERS MADE FROM IT.

(Communication No. 75 from the Research Laboratory of the Eastman Kodak Company.)

In the early days of orthochromatic photography the dye generally used for the preparation of light filters was picric acid, this having the advantage of simplicity and cheapness and of great efficiency, picric acid absorbing the ultra-violet almost completely, and having a very sharp cut in the spectrum. The disadvantage of picric acid, however, is that it is unstable to light, filters made with it soon turning brown. For this reason the early gelatine filters were made chiefly with tartrazine, which is very stable and gives permanent filters. Tartrazine, however, has the disadvantage that its absorption in the ultra-violet is unsatisfactory, and even moderately deep tartrazine filters transmit appreciable amounts of ultra-violet, this detracting very much from their efficiency. For this reason filter yellow, introduced by Hoechst in 1907, rapidly displaced tartrazine as the best dye for filter-making, and has held that position ever since.

Filter yellow is extremely stable, absorbs the ultra-violet strongly with the exception of a transmission band at 300$\mu\mu$, which, since it is absorbed by glass, is of little importance, and has a satisfactorily sharp cut for the preparation of orthochromatic filters. A disadvantage of filter yellow which has always been recognised, however, is the fact that its absorption curve was less sharp than that of picric acid, and for many purposes, especially the preparation of very light filters, a dye possessing the stability and ultra-violet absorption of filter K, but of greater sharpness of cut, would be desirable.

When the need for light-filters of high efficiency for aerial photography arose the need for such a dye became pressing, and we undertook a search for such a material. After a great number of trials it was found that suitable absorption and stability were possessed by the phenyl-glucosazones.

When certain sugars, such as glucose, are warmed with a solution of phenyl-hydrazine in dilute acetic acid, yellow precipitates are produced possessing definite crystalline structures, by which the sugars may be characterised. These yellow substances are known as osazones, those formed with phenylhydrazine being termed phenylosazones. On measurement of the absorption spectrum of glucose-phenylosazone it was found that the absorption curve was very sharp and extended far into the ultra-violet, and since the material is well known to be stable, it appeared that a dye prepared from it would possess the properties required for the preparation of light yellow filters.

Glucose-phenylosazone is insoluble in water, so that to obtain a dye it is necessary to have a salt-forming group present in the molecule, and to produce a dye suitable for use with gelatine it was desirable that this group should be an acid one. To obtain such a derivative of glucose-phenylosazone which will form salts with metals it is merely necessary to substitute for phenyl-hydrazine a derivative containing an acid group and condense glucose with it in the same manner. Several such derivatives were tried, and the most satisfactory result was obtained with glucose-phenyl-osazone-para-carboxylic acid. This was prepared in the following way:—

Para-nitrotoluene was oxidised to give para-nitrobenzoic acid. This was then reduced to para-aminobenzoic acid, which was diazotised, and gave para-hydrazino-benzoic acid or phenylhydrazine-para-carboxylic acid. The glucosazone of this acid is a yellow crystalline compound insoluble in water and almost insoluble in alcohol. It forms a sodium salt which is extremely soluble in water, but which can be precipitated from concentrated solutions by the addition of alcohol, and this sodium salt of glucose-phenyl-osazone-para-carboxylic acid has been adopted by us for the preparation of light-filters under the name of "Eastman Yellow."

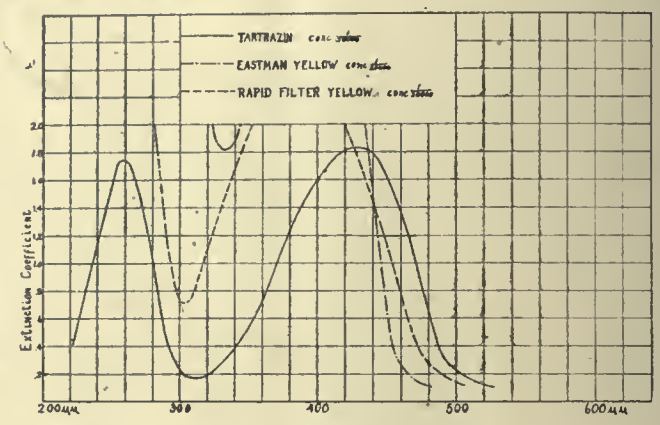


Fig. 1.

In Fig. 1 are shown the absorption spectra of tartrazine, filter yellow, and Eastman yellow, from which it will be seen that the Eastman yellow has a sharper cut than filter yellow, and almost as strong an absorption in the ultra-violet.

Light-filters prepared from it retain these characteristics, and these light-filters have been prepared and specified under the names of EK 1 and EK 2 light-filters. A special filter for aerial photography has been adopted by the American forces under the name of Aero No. 1.

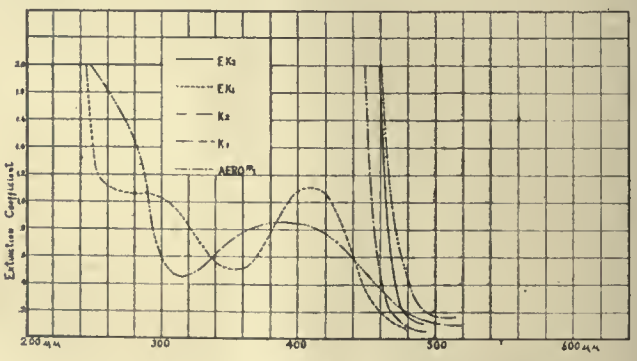


Fig. 2.

Fig. 2 shows the absorption curves of these light-filters.

As regards stability, it was found on test that the new dye was not quite so stable to light as filter yellow, but was superior to all other yellow dyes tried, and its stability is amply sufficient for the preparation of light-filters, since it requires weeks of exposure to direct sunlight to produce a change even in the lighter-coloured filters.

C. E. K. Mees.
H. T. Clarke.

PRACTICUS IN THE STUDIO.

STUDIO EXPOSURES.

Correct exposure is one of the most important of the factors in making perfect photographs, yet the majority of portraitists approach it in the most casual manner, and apparently trust to a sort of sixth sense to tell them how long to keep the shutter open, or as one said to me, "It is like taking a dive into water; when I press the bulb, I do not know when I am coming to the surface." With long practice it is possible to work successfully in this sub-conscious way, but most people will find it desirable to have some definite idea of the number of seconds necessary to give the exact quality of negative which is aimed at. I want you to take particular notice of those last words. There can be no fixed standard of exposure or density in portrait work, or we should all arrive at one monotonous style, without that touch of individualism which now distinguishes our best photographers from one another. Twenty or thirty years ago there was an established ideal of a clear, sparkling negative ranging from clear glass to opacity, and a high-class operator who did not conform to it had little chance of employment. Many negatives which would be appreciated to-day were then thrown aside as failures, because they were too soft or too hard to print in the limited range of media then available, but now we are more free to choose our methods, and can produce negatives to satisfy our own artistic instincts. Therefore it is necessary if we are to be consistently good in our work we must not trust to "flukes" for our successes, but to study the conditions under which our particular class of negatives can be obtained.

On asking one of our best known outdoor photographers how he secured such uniformly perfect negatives, I was told that they were obtained by "exposing to suit the developer." This was in the pre-Watkins days, when no attempt had been made to systematise development and most people believed that the clever worker owed his success to modifying the developer according to the appearance of the image, often beginning with plain pyro solution, and working up the negative by adding alkali and bromide drop by drop. This idea is now exploded, proving that my friend was a true prophet when he asserted that the prime factor in producing the negative was correct exposure. Messrs. Hurter and Driffield, to whom photographers owe so much, have taught us that the amount of silver affected by light when a plate is exposed is in definite proportion to the length of exposure given, but this assumes that all the silver so affected is reduced by the developer, or, in other words, the plate is "developed right out," which is rarely the case in studio work, most portraitists finding that such a procedure produces too much contrast. This fact has been recognised by both plate and developer makers who prescribe different times of development for portrait, landscape and copy negatives, the former always being much shorter than the latter two.

To establish a correct method of exposure we must make a few experiments, working with a standard developer, and a fixed time of development, which may be obtained by the factorial system, the only variation being made in the exposure. It is convenient and economical, besides assuring uniformity of rapidity in the emulsion, to make several exposures on one plate, and this can easily be done in most studio cameras by fixing a small mask in the camera back and marking the slide so as to show when the plate is in position. The easiest size is to work three upon a half-plate, cutting a mask with opening two inches by four and fixing this in the existing carte or cabinet mask. If the slide has notches for single exposures, and also for repeating two C.D.V. on half-plate, the centre notch may be used, but new marks a little farther from the centre must be made for the two end exposures. For my own use I have made a repeating back which allows of four exposures, each three inches by two clear, from the rebate upon a half-plate, and this I find handy for many other purposes.

The exposures, which must, of course, be upon the same subject, may be varied in any proportion which the operator desires. Usually double at each step will be found as good as any for portrait work, as our negative will then show us the effect of one, two, four, and eight seconds' exposure. The result will be rather surprising to those who try it for the first time; for, supposing that the one-second exposure gives a thin but printable negative, it will be found that the eight-seconds section, although thick and slow to print, will also yield a passable result. That, however, is not my point, which is that the operator should now select the exposure which gives him the quality of image he wants, or if none quite pleases him should give an exposure between the two which he judges to be nearest correct. So far so good. Now all depends upon correctly estimating the value of the light, and this can better be done with an exposure meter than by the exercise of personal judgment. If we use an ordinary Bee meter and note the time taken to match the tint at the time of making our exposures we shall be able to establish a ratio between meter time and exposure for any light or lighting. For example, if we find that our selected exposure is four seconds, and that it took eight minutes to get the tint, we have the proportion of half a second for each meter minute. Naturally I do not propose that anyone should make meter tests while a sitter waits, but an occasional test between whiles can easily be managed. The plate speed and lens aperture must be unchanged, or due allowance must be made, or this system will be worse than useless.

It is often found that when strong effects of light and shade are being tried for that the negatives turn out hard and chalky and do not at all represent the model as seen by the artist. There are two causes of this, both closely connected, under-exposure and over-development, the latter being due to an attempt to force out shadow detail. Now, if development had been done by time without regard to the appearance of the image, we should have retained the detail in the high lights, but the shadow detail would still have been wanting. Longer exposure would remedy this without giving flatness, unless quite an unreasonable time were given. This class of subject affords an excellent field for the progressive series of exposures already recommended; or if it be thought that the effect cannot be judged from so small a plate two full-sized exposures may be made, one receiving three times as long as the other, both being developed for the same time in the same dish.

It is important when making experiments in exposure to keep not only to one make of plate, but to the same grade. Emulsions vary in character, and two grades which are, perhaps, marked 200 and 240 H and D, cannot be relied upon to give the same quality of image, even if the difference in speed be accurately allowed for; much more is this the case if two makes of plate be mixed up. For the same reason one developer should be adhered to, and for printing quality and adaptability to various subjects and lightings there is nothing to beat the old-established pyro-soda. Remember that a negative is only a means to an end, and that "pretty" negatives do not always give the best of prints. Although not strictly within my subject, I feel that at the present time of year it is not amiss to mention that pyro is less affected in its action by variations of temperature than most other developing agents. I have only

recently found the slow action of another developer mistaken for under exposure, with the result that the exposures were increased and flatness resulted.

A point which must not be missed is the effect of the distance between lens and sitter upon exposure. This is always allowed for in copying, but is often overlooked in portraiture. Most operators know that a large head requires more exposure than a full length, other things being equal, but perhaps could not tell you why. There are two reasons, one being the increase in the focal length of the lens as the sitter approaches the camera, and the other the flattening of the lighting by the greater amount of atmosphere which intervenes as the sitter is placed further from the camera. Let us consider the former case, assuming that a head measures 9 inches in height and we are making a 3 in. image of it; this adds one-third to the camera extension, supposing we are using an 18 in. lens working at F/6 for infinity; one-third added to the focal length gives us 24 ins.—in other words, we are working at F/8, which requires practically double the exposure. When taking a full-length cabinet the reduction would be 1/12th, which would only add an inch and a half to the original focal length, and this we could safely ignore so far as exposure is concerned. In the second case the increase in exposure is only apparent, not real. If there is a certain amount of fog over the shadows it covers the bare glass, but there is no more detail in the shadows than there would be if the atmosphere were perfectly clear. In London, where the atmosphere is as thick in winter as it is in most places, many photographers use a lens of shorter focal length than they would otherwise, in order to avoid this flattening.

In conclusion, let me impress upon the novice that correct exposure is the key to satisfactory results. Leaving colour effects out of the question, any arrangement of light and shade can be correctly reproduced if the proper exposure be given. We can flatten the scale by over-exposure, we can sharpen it by under-exposure, so that if we hit the happy mean we shall get upon our negative what we saw when looking at the sitter. Surely such a consummation is worth taking pains to attain, instead of following the usual "hit or miss" way.

PRACTICUS.

THE GUM BICHROMATE PROCESS WITH A NEW COLLOID.

[The following is the extended account, as published in the Journal of the Royal Photographic Society, of the experiments made by H. S. Starnes and the subject of the paper read by him some time ago before the Society, Mr. Starnes, it will be seen, employs, instead of gum arabic, gum senegal and prepares this latter gum upon the paper in an acid condition. In this respect the process bears some resemblance to that of Mr. Nelson K. Cherrill published some years ago in which arabinic acid of gum arabic was previously separated by treatment of the gum with acid.—EDS., "B.J."]

He considered that the bichromate printing process was an ideal one, for the following reasons:—1st. There is an almost unlimited range of colours; 2nd, if suitable pigments are used there is no doubt about their permanence; 3rd, there are no such things as double tones; and, 4th, there can be the same surface of paper as in an engraving. On the other hand, the gum-bichromate process will not give the same fineness of grain that a silver print does, but except for small portraits the grain will probably be fine enough.

In all types of bichromate printing the principal difficulty is in removing only the soluble parts not acted upon by light. In Sir Joseph Swan's original carbon process the film of gelatine and pigment was transferred to a temporary support and the soluble matter was washed away from the back quite satisfactorily, but it required double transfer and warm water. Then came the Artigue process, which did away with the double transfer, but had to be developed with wet sawdust, and frequently the lighter detail would not stand the friction, and was washed away.

Shortly after the advent of the Artigue process the lecturer worked out a process which Sir Joseph Swan told him was the first real advance in bichromate printing since the original patent. The exposed print was soaked in water for a minute or two and laid face upward on a piece of glass, a piece of dry blotting paper was laid over it, and a soft clothes brush was brushed over the back. The soluble part of the film was taken up by the blotting paper, and the insoluble portions forming the image, especially the lighter tints, were pressed down into closer contact with the paper support. Sir William Abney had suggested to him that possibly that method of development might give a suitable grain for process work. The lecturer had no experience of process work, but was pleased to pass on the suggestion to anyone who could make use of it. Although the blotting paper preserved the light detail, still the lecturer had the same trouble as those who tried to revive Pouncey's method of printing very deeply and removing the soluble portions with a wet brush—there was no dependence on the condition and solubility of the gum arabic.

When the bichromate printer was an artist he could remove what he liked and leave what he pleased, but the ordinary worker lacking that ability was likely to give the process up in despair. He felt, however, that there was something in the process if he could get a more suitable colloid than gum arabic. He had gradually worked his formula down to the point that to get the best results the paper must be coated so thinly that one minim of the combined mixture of water, gum, pigment, and bichromate must cover four square inches of surface. The brush, the sawdust, and the nozzle of the garden hose were all too brutal in removing the pigment, and blotting paper was too expensive. After experiments, he came to the conclusion that a straight tube about 3 in. in length, with a bore about the same as in a tobacco pipe, and fitted to the domestic water tap, answered well, as the force of the abrasion could be controlled by varying the supply of water. When he wished to concentrate the action of the water upon small areas he used smaller nozzles, which fitted over the first one. There was then pleasure and interest in working on every square inch of the picture.

In searching for a suitable paper he discarded most of those used by the bichromate printers for one reason or another. Cartridge paper and the cheaper drawing papers allowed the coating to sink in unequally. Whatman's paper, in addition to being expensive, allowed the pigment to sink in to some extent, which, although just what the water-colour painter wanted to prevent washing up, was not the property wanted when using the bichromated solution. Some pre-war note-papers were better, and he found a paper used in collotype printing which was at first excellent, but later samples were of inferior quality. He was now using a foreign paper obtained from Spicer Bros., and would send a sample to anyone who sent a stamped directed envelope to him at King Henry's Road, Lewes.

Some of the pigments he had tried contained a proportion of dye, which stained the paper. Messrs. Brooke, Simpson, and Spiller had made him a stock of suitable pigments. He used a carbon black modified with blues, browns, or reds, as required.

He found that refined sodium bichromate worked better than the other bichromates, and got a good sample from J. J. Griffin, Ltd. The stock he has was made in Germany, but he hoped that English firms would now make it.

Nine-tenths of the trouble in bichromate printing arose from the varying characteristics and conditions of the colloids used. The conditions in which gum arabic is collected and stored make it hopeless for the purpose. He found that he might get passable results with it from one negative, yet could do nothing at all when working

from another, even though the paper in use was cut from the same coated sheet. The problem had bothered him for years.

He had to make a rather startling statement, which was that under certain conditions the action of light makes a bichromated colloid soluble instead of insoluble. This would explain why the readings of the actinometer were not always reliable, and why one type of negative would give better results than another. The action seemed to be as follows:—When the bichromate is added to the colloid it renders the latter more or less insoluble at once. On exposure to light it slowly becomes quite soluble, and after it has reached that stage it begins to get insoluble as under normal conditions. Different samples of gum work differently with regard to the length of time for those two actions to take place. Freshly-made solutions are more prone to act so than solutions that have been kept for some time.

At first he thought that different samples differed as slow and rapid plates do; then he found that there must be two actions going on simultaneously, because the parts of the print under the densest parts of the negative were darker than under the half-tones, while under the lightest (or clear glass) parts of the negative the prints seemed to print normally, but not with the density that the amount of pigment ought to have given; so evidently some of the gum was not holding the pigment on to the paper. One day he got a print that had a black sky. The trees in the distance looked as though they were covered with snow, and the shadows, which ought to have been the darkest parts of the print, were simply half-tones. That print gave him a clue to the mystery. He showed a print which at the first stage of exposure was a negative from a negative; another showed the two actions going on simultaneously during the same exposure to light, and another which had first gradually been rendered soluble until, by the time it was soluble under the densest part of the negative, the other parts had again become insoluble in their proper sequence, and it was becoming a practically normal print. He was inclined to think that the first stage was purely a physical one, that the bichromate had bound up the colloid too tightly, and that the first thing the light had to do was to unfasten the straps, if he might use that phrase.

About thirty years ago he had written an article for THE BRITISH JOURNAL OF PHOTOGRAPHY, in which he gave a somewhat similar explanation of the action of light on a dry plate.

He had searched through many books on bichromate printing to see if a double light action of this kind had been observed, but no one seemed to have noted the phenomenon. The matter was one of considerable importance, as it accounted for a very common fault in prints. It was often found that bichromate prints break down in the rendering of the lightest tints, because under the densest part of the negative the film, instead of being made insoluble for the lightest tints of the print, would be undergoing just the reverse action, and would be made even more soluble, and would wash away more easily, so that it appeared as though the print had been under-exposed. The lecturer had made many experiments in the hope of finding some method of keeping the film of bichromated pigment soluble, so that the light action should be restricted to its legitimate function of insolubilising it according to the gradation of the negative. It was not until he had worked out the following formula that he began to see daylight:—

A—Sodium bichromate		1 oz.
Water		2 oz.
B—Alum, saturated solution		4 oz.
Hydrochloric acid		2 drams.

Take one part of A to three parts of B. If with a certain sample of gum this makes the film too soluble, then reduce the amount of B.

Having found gum arabic to be unsuitable, he had tried a number of other colloids, and finally hit upon gum senegal. As an adhesive it was probably not satisfactory, but for printing purposes it works much better than gum arabic, being softer, less brittle, and more under control. It contains 81 per cent. of arabin, as against 70 per cent. in gum arabic.

To make the gum solution a quantity of it is suspended in a bag or wire cage in 1 pint of water, and as it dissolves more is added until one fluid ounce weighs 9 drachms. To measure the pigment a salt spoon is used which will hold just 20 minims of water, and four spoonfuls of the pigment (strike measure) are taken; the precise quantity may vary according to the covering power of the colour, and is ground up with 1 drachm of methylated spirit. This is added to 1½ drachms of water, mixed thoroughly, and placed in a test-tube to settle for a few minutes. One and a-half drachms of the gum solution is taken, and to it is added about three-fourths of the pigment solution, care being taken not to shake up the coarse sediment at the bottom of the test-tube, and the whole is mixed well together. The pigment that had settled at the bottom of the test-tube should be re-ground and added to the mixture. To that is added 1 drachm of the sensitising solution, consisting of 15 minims of solution A and 45 minims of solution B. In winter, solution A may be increased to 20 minims. The quantities given will coat about twelve pieces of paper 10 in. x 8 in.

To coat the paper it should be fastened by one corner to a sheet of glass or zinc, supported if necessary on a wooden board, which in turn rests upon a penny laid on the table, so that the device may be revolved easily in any direction. A spoonful (20 minims) of the mixture is poured along the length of the paper from left to right at about ½ in. from the edge. The colour should be spread evenly over the paper with a 2-in. varnish brush with light strokes, turning the turntable as required, but always keeping the brush flatwise on the paper. If the brush is turned edgewise streaks will appear. With a little practice it will be found quite easy to coat 4 square inches of paper with 1 minim of the mixture.

The coated paper should be placed about 2 ft. from a fire or gas stove, and by the time the second piece of paper is coated the first will be dry. After use the brush should be cleansed with water and a nail-brush and dried thoroughly before it is again used.

The exposure is about one-eighth of that required by P.O.P., and is gauged by an actinometer.

For development the print is soaked in water for about a minute and then flooded with solution B (acid alum) 1 drachm, water 2 oz. If the exposure has been correct the colour in the high lights will be seen to float away in a few seconds. The print is then put on a glass easel in the sink and development completed with the aid of the rubber tube and nozzle device previously described. More control over the print is obtained by giving a longer exposure and by using the acid alum solution in a stronger condition.

DARK-SLIDES OUT OF REGISTER.

IN three out of four studios that I have visited in the course of the last year or so, I found the dark-slides of the camera in general use out of register with the focussing screen. The present use of rapid plates enables the photographer to use diaphragms to an extent that disguises considerably the want of fine definition, resulting from the plate not being truly in focus. In the days of wet collodion, when, in order to secure a portrait free from the unsharpness, due to movement of the sitter, it was the custom to use the lens at full aperture or nearly so, photographers had to be, and were, careful to see that their dark-slides were truly in register with the focussing screen.

Although the want of sharpness in the negative, due to the slides not being in true register is less conspicuous when using the smaller apertures to which the use of rapid plates has accustomed us, it is still very desirable that the coincidence of position of the plate and the focussing screen should be as complete as possible, if only for the power obtained to get properly exposed results with the shortest exposures, particularly in the case of portraits of children. A photographer, the proprietor of a high-class establishment, doing a large business, writes me that since the correction of his slides his operator generally takes portraits of children with the open lens with excellent results, and with fewer failures and consequent economy of time and plates.

The plan which I employ to ascertain the truth, or want of it, of the registry of the slides, is to take a strip of wood about ⅜ or ½ an inch in thickness, rather longer than the width of the slide, and to drive a screw through it. The strip is laid across the front of the frame of the focussing screen, and the screw advanced until the point just touches the screen itself. A plate is now put in the dark-slide, the back is buttoned down, and the shutter is drawn. The strip is then laid across the front of the slide, and if it is in true register, the screw point will just touch the plate. It is desirable to repeat this trial with the plate placed both vertically and horizontally, and with each carrier that may be in use with the slide. A waste negative is better than a plain glass for the purpose, as a

faint scratch on the film will indicate very closely coincidence of the two surfaces.

The reason for having the wood a little longer than the width of the slide is (as I have found in one or two cases) that the top or bottom or one of the sides may be higher or lower than the opposite side, and the extra length of the wood allows the screw to be tried on different parts of the plate. The screw is inserted at the place where it will come over the middle of the screen when one of the ends of the wood is just at the outer edge of the frame. This arrangement allows full use to be made of the extra length of wood for the testing the truth of adjustment away from the centre of the screen. The extent of deviation from coincidence is ascertained by placing slips of card of different thicknesses between the point of the screw and the focussing screen, or the plate as the case may be, until a piece is found of a thickness that just fills the space.

If it is the focussing screen that is found to be nearer to the front than the plate, a cardboard matt is cut of the same size outside as the ground glass; about a quarter of an inch wide all round except at the corners, where it is rounded inside for strength. A photographer generally has a stock of old mounts of various thicknesses, but if there is not one of just the thickness required, one or more thicknesses of cartridge paper may be pasted on to a thinner card, and when dry used for the purpose. The card matt is dropped into the frame, and the glass replaced and the slip-beading pinned in again.

If it is the plate that is too near the front, slips of card are glued on all round to the rabbet of the dark-slide. It may be that some of the carriers may require adjustment independent of what has been done to the dark-slides. In this case they may be trued by gluing slips of card along the edges of the front, or, if the error is in the other direction, by reducing the thickness of the wood in the same place.

Of course, a neater job may be made by sending the slide and frame of the focussing screen to a camera maker or to an intelligent cabinet maker, if (which is not often the case) the camera can be put out of use for the time, but the home cure method described has answered perfectly well.

W. E. Debenham.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Saturday, February 1.

Rodley and District Photographic Society. Annual Exhibition.

Monday, February 3.

Bradford Photographic Society. Yorkshire Photographic Union Slides. Also Members' Slides.
City of London and Cripplegate Photographic Society. Ladies' Evening. "From Alp to Apennine." J. D. Johnston.
Dewsbury Photographic Society. Y.P.U. Portfolio.
South London Photographic Society. "Experiences of a War Photographer." H. Creighton Beckett.

Tuesday, February 4.

Royal Photographic Society. "English Fonts from Saxon Times to the Sixteenth Century." S. Gardner.
North Wilts Field and Camera Club. "The Unofficial Side of Aviation." Air Mechanic L. A. Peckham, R.A.F. (Service exigencies permitting).
Hackney Photographic Society. "Portraiture—Its Aims and their Achievement." A. Akerman.
Chelsea Photographic Society. A.P. 1917 Prize Slides.

Wednesday, February 5.

Croydon Camera Club. "Picture Making." R. H. Lawton.
Edinburgh Photographic Society. "Cinematography." Lieut. Haggard.
Tunbridge Wells Amateur Photographic Association. "A Drive Into Belgium." W. L. F. Wastell.

Thursday, February 6.

Liverpool Amateur Photographic Association. "Three Men in a Car." J. Shaw.
Brighouse Photographic Society. Annual Meeting.
Huddersfield Naturalist and Photographic Society. Lantern Lecture, "Life and Scenery in the Alps." P. Lund.
Hammersmith (Hampshire House) Photographic Society. Joint Exhibition of Pictures. Mr. and Mrs. Giles.
Rodley and District Photographic Society. Members' Night.
Wimbledon Camera Club. Velox and Transferotype Demonstration Mr. Slater.

THE PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

A meeting of the Council was held on Friday, January 17. Present:—Messrs. G. Hana, A. Basil, Gordon Chase, A. Corbett, C. F. Dickinson, A. Ellis, S. H. Fry, W. E. Gray, R. Haines, A. Mackie, Lang Sims, R. N. Speaight, H. A. St. George, F. G. Wakefield, Marcus Adams, Frank Brown, W. B. Chaplin, T. Chidley, Montague Cooper, P. Lankester, H. C. Spink, and A. Swan Watson.

The Hon. Secretary reported that the Government scheme of demobilisation of owners of one-man businesses afforded an opportunity for the Association to do more to secure release from service than could be done by the man himself or his wife. The scheme was in itself simple and complete, and any failure could only be due to errors of administration.

The Hon. Secretary read a draft of the Report of the Council to be presented to the annual general meeting, which was passed.

The Hon. Treasurer presented his balance-sheet, and in commenting on the figures showed that although the number of subscriptions collected exceeded that in any previous year, and there was a small balance of receipts over expenditure, the increasing expenses of conducting the Association owing to high prices in every direction, including the cost of producing the P.P.A. Circular, would necessitate raising the amount of the subscription.

Report of the Committee appointed at the last meeting of the Council upon Mr. Adams' scheme was read, in which the raising of the amount of the subscription was advised.

After discussion it was decided to propose at the annual general meeting an alteration of the rules to raise the annual subscription from 5s. to 10s. per annum.

The Hon. Secretary reported that he had had a conference with Mr. A. C. Brookes, and learnt that it would not be possible to hold an exhibition at the Royal Horticultural Hall this year, as the Government were retaining possession of the building, and there was no other building in London available, but he intended to hold the exhibition in 1920.

At the conclusion of the business a special meeting of the Council was held in accordance with rule 12 to nominate a President and twenty-four members of Council to serve during the ensuing year.

ROYAL PHOTOGRAPHIC SOCIETY.

Meeting held Tuesday, January 28, the President, Dr. C. Atkin Swan, in the chair.

The President delivered his annual address, in which he first of all briefly reviewed the state of photography during the war. In lenses and cameras, as used in aerial photography, he was happy to say that the Germans had been beaten in manufacture. He had had opportunities in France of seeing the inferiority of their instruments at different stages of the war, and he had obtained official confirmation before making the statement. In chemicals he said it was only necessary to refer to the name "Johnson" in order to point to the supply of chemicals previously supplied by the Germans. He referred also to the Paget process of colour photography of which good use had been made in the war.

Turning to the domestic affairs of the Society, the President uttered a strong plea for a full co-operation in its progress by the whole body of its members. He instanced many directions in which their efforts could be extended and said that it was his desire to see the Society's house the headquarters of all kindred photographic societies and the centre to which anyone interested in photographic matters would naturally gravitate. In regard to the presence of persons of enemy nationality previously on the books of the Society, Dr. Swan made it very clear that were they to be re-instated he would resign from his presidency. Loud applause followed his declaration that, after the brutalities of the Germans, they could never be received again.

On the proposition of Mr. John H. Gear, seconded by Dr. Rodman, the thanks of the meeting were accorded to the President for his address.

CROYDON CAMERA CLUB.

The club got nicely hoist with its own petard last week when Mr. R. H. Lawton, F.R.P.S., gave a lecture on "Picture Making." It was illustrated by many of his works, which, it may be said, really deserved the appreciation he expressed about them, and no higher praise can be given. How far he was pulling the leg of everyone present remains a matter of doubt; that he succeeded in highly amusing all, making things go with a swing, and imparting much useful information is a matter of fact. Hailing from Ilford,

this Society, as represented by Mr. Lawton, outplayed Croydon at its own game.

He began by saying that he arrived as the Apostle of Faking, which was the highest form of technique regardless of what scoffers might say. He knew he was right, and this being so, contradiction was obviously futile. With exposure meters it was as simple as simple could be to turn out technically perfect negatives. Although a truly great man in many directions, he took no credit for invariably producing such.

He then passed round a straight print from a mechanically made negative and defied any to find a single blemish, adding that all of the many exquisite works of art to be shown were numbered, so that none could be appropriated without the fact being discovered. "It is a large assumption that any will desire to do so," here remarked a member dealing the first counter-blow.

The lecturer next dealt with the control methods employed by him, which are on similar lines to those recently demonstrated by others, viz. :—a liberal application of blacklead, or sepia powder to bromide prints, in his case applied with a Bromoil brush. These diversions have been fully recorded, and need not now be discussed. Many negatives were made by copying in the camera worked-up bromide prints, and he maintained no loss of quality need ever occur in the process. When enlarging he had found two or three separated layers of chiffon on the lens introduced a soul into the picture.

In reference to retouching, he scornfully derided those who adopt a standard stipple for all subjects. He employed a dozen different strokes and showed some on the blackboard, the correct "silver birch trunk" touch being much admired. With portraits, freckles demanded a series of radiating lines meeting each other about the centre, which thus received the most lead. Retouchers who have been accustomed to work in other ways should now realise how fatuous they have been. He strongly recommended the medium of the Autotype Co., and advocated that the pencil should be so finely pointed as to break off directly it was applied. This is a point often overlooked. Unfortunately, the cogent reason he gave is forgotten. Before applying the medium the film should be bone dry; if not, a coarse grain may result. With the fine retouching obtained by him, and possibly by others less gifted, any degree of enlargement should not render it obtrusive. Enlargements made by him up to 24 by 18 (inches or yards not specified) showed not a trace of handwork applied to the original.

Composition was now tackled, introducing the mystic "S" and "7" business. The former is fairly complete in itself, the latter requires balance. The necessity for a good stock of sky negatives was insisted upon, and he thought nothing of waiting years for a sky to turn up suitable to fit a landscape in hand. As regards photographic critics in general Mr. Lawton delivered the most unflattering opinions. Mr. Tilney was an important exception, having expressed appreciation of his (the lecturer's) pictures on more than one occasion. Once he exhibited a perfect gem at his Ilford Society. It sounded almost incredible, but the judge never even awarded an "honourable mention." Giving his reasons for the awards, a conflict occurred between him and the exhibitor. "I have been studying photography for thirty years, and *ought* to know what I am talking about," said the judge, not in the best of temper. "I have been studying Nature for the same time, and *do* know what I am talking about," snapped the exhibitor. The print was then sent to many exhibitions and secured the first award in all, refused by the R.P.S., tendered again the next year, and accepted.

In the discussion Mr. H. P. C. Harpur said tulle was better than chiffon for diffusion. Being the inventor probably he was right. Mr. J. Keane felt very sad that the lecturer had sniffed at Bromoil. Why this snuffness? Mr. J. M. Sellors was delighted with the advocacy for blacklead, etc., for powdering-in art on bromide prints. On the other hand, the process might be terribly dangerous, resulting in horrible monstrosities. In this contingency it should be understood that Mr. Sellors was referring to the work of others, which is usual. Mr. E. A. Salt denied that the average pictorialist produced technically perfect negatives. Generally the reverse. First-class printers were not so easy to secure as had been made out. The lecturer's remarks on copying must be accepted with qualifications. Given a high-class printing negative full of gradation and extended range, say, of the usual professional portrait type, then no copy of a print would quite equal the original.

Mr. Lawton, in reply to Mr. Keane, denied sniffing, but he certainly had one objection to Bromoil, and that a big one. His method was slow and sure, allowing unlimited time for judgment to come into play. The Bromoilist had to work so fast that unless he was a trained artist false tonality and other errors were bound to be introduced. Far better for such to abandon the process and take to breeding rabbits instead, a safer and more profitable pursuit. A most hearty vote of thanks was accorded the enterprising lecturer.

The Sheffield and District Professional Photographers' Association.—By invitation, this association's January meeting was to have been held in the studio of the President, Mr. G. T. Dickinson. The illness of this gentleman, however, compelled the cancellation of this arrangement. Miss Ethel M. Eadon very kindly invited the association to meet in her studio, Glossop Road; and the invitation was gratefully accepted. A fair number of members spent a very pleasant evening, and, while little business was done, all thoroughly enjoyed the opportunity offered to inspect a very highly-organised and well-equipped studio. A hearty vote of thanks was accorded Miss Eadon for her kindness. The S. and D.P.P.A. want more members.

FORTHCOMING EXHIBITIONS.

February 10 to 22.—Glasgow and West of Scotland Amateur Photographic Association Inter-Club Exhibition. Secretary, Gilbert S. McVean, 125, West Regent Street, Glasgow.

February 20 to 22.—Leicester and Leicestershire Photographic Society. Secretary, H. C. Cross, 80, Harrow Road, Leicester.

February 22 to March 8.—Edinburgh Photographic Society. Entries close February 13. Secretary, George Massie, 10, Hart Street, Edinburgh.

Commercial & Legal Intelligence.

NEW COMPANIES.

Precision Lens Moulding Co., Ltd.—This private company was registered on January 15, with a capital of £2,000, in £1 shares. Objects: Pressers, moulders, and shapers of glass and other materials in preparation for the manufacture of lenses for optical instruments, and for other purposes, etc. The subscribers (each with one share) are:—C. H. Watson, 313, High Holborn, W.C., manufacturing optician; F. W. W. Baker, 313, High Holborn, W.C., manufacturing optician. First directors:—C. H. Watson, A. H. Emerson, and W. E. Oakden. Registered office, 3, Chapel Place, White Hart Lane, Tottenham, N.

The Belfast Strike.—Owing to industrial strikes, Monday morning last found Belfast without gas or electricity. Darkroom work in the local studios was seriously handicapped while photographers entirely dependant on electric studio illumination were unable to commence business.

Australian War Photographs.—A valuable record of Australia's part in the war has been published in pictorial book form. The volume contains 170 photographs, of actual fighting and other war scenes, taken by the Australian official photographer, Captain Wilkins, M.C., who, by the way, was the photographer with the Stefansson Arctic Expedition. The collection covers operations from November, 1917, to the signing of the armistice. The cover bears a typical war sketch by Lieutenant Fred Liest, and the introductory note is written by Mr. W. M. Hughes, Prime Minister of Australia, who says:—"This collection of photographs will be absorbingly interesting to all Australians, for the places portrayed have been made famous by the deeds and sanctified by the blood of their kinsmen." The book is obtainable at the A.I.F. Publications Section, Australia House, Strand, London.

News and Notes.

French Luxury Tax Amendment.—Private advices from Paris (writes "The Times") show that the French Government has under consideration a new measure for modifying the luxury tax, which has not yielded the results which had been hoped for. It is proposed to exclude certain goods, such as photographic accessories, from the operation of the tax entirely, and to limit the tax on certain articles to those costing 250f. (£10) or more. If the proposals are carried through, a suit of clothes costing 300f., which at present is liable to a tax of 10 per cent. on the full amount, would be taxable to the extent only of 10 per cent. on the excess over 250f., which would mean a total payment of 5f. It is also intended in view of the further general rise in prices to raise the price limits which determine whether articles shall be classed as luxuries or not.

Journalists' War Matinee.—A great Victory matinée which is being organised by the National Union of Journalists in aid of their War Distress Fund for the dependents of all British sailor, soldier, and airmen journalists killed in the war, will take place at the Coliseum on Sunday next (February 2). A splendid and varied programme has been arranged by Mr. Oswald Stoll, the artists including Miss Ellen Terry, Miss Lily Elsie, Miss Teddie Gerrard, Miss Lydia Kyasht, Miss Madge Titheradge, Mr. Mark Hambourg, Mr. Nelson Keys, Mr. Alfred Lester, Sir John Forbes-Robertson, Mr. Albert Whelan, and the Gresham Singers.

Mr. George Robey, C.B.E., will hold an interesting auction, in addition to giving a special performance. Among other items, he will sell an autographed copy of President Wilson's "Fourteen Points," which the President has sent to aid the funds. Lord Weir has given a German propeller taken from a captured Fokker triplane (the same type as Baron von Richthofen flew), and Sir Henry Trenchard, Commanding the Independent Force, R.A.F., has forwarded a unique photograph of the German town of Offenburg taken during an air raid. Sir Ian Hamilton has presented for sale a tobacco-box shot off his table in Gallipoli, and General Sir John Monash, the Australian Commander, the sword which he fought with during the same campaign.

The Journalists' Committee hope, by their effort, to secure sufficient funds to enable them to avoid further appeals. Seldom have journalists appealed on behalf of their own people, while always lending a helping hand to other causes, and they now look to the public for support to make this matinée a great financial success. There are still several boxes and stalls to dispose of. Application for these should be made at once to the Coliseum or to the Matinée Committee, 180, Fleet Street, E.C. Donations to the War Distress Fund, which will be heartily welcomed from those who cannot attend the matinée, should be sent to the latter address.

Correspondence.

**** Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

**** We do not undertake responsibility for the opinions expressed by our correspondents.*

ARE MATERIALS PRICES TO FALL SOON?

To the Editors.

Gentlemen,—It may interest your many readers to know that the days of cheaper sensitive materials are now not very far off, and that we shall shortly have suave and smooth-tongued commercials calling upon us begging and praying us to give them orders.

The "writing on the wall" appears this week in the "Labour Gazette Supplement" issued by the Government. For many months it has been part of my work to deal with certain items in this special "Supplement," and I have watched it grow from practically nothing to a more or less healthy publicatinn consisting of eight very crowded pages. This official list, as some of your readers may know, contains the names of people to whom contracts have been given by the Government, and as a photographer I have been in the habit of turning first to the sub-heading "Photographic Stores" in order to see and make a note of the various photographic firms securing Government contracts, and as a consequence have never marvelled at the great increase in prices of sensitive materials and apparatus.

Yesterday I had delivered to me the current issue of the monthly "Supplement," and oh, Hamlet, what a falling off was there! The official list of War Office and other contracts given out by the Government has fallen to three and one-quarter pages, and no names of photographic firms or manufacturers appear in the list! The sub-headings go from "Paint" to "Pumps," "Puttees," and other necessaries without a word of apology from the Government. Names which have appeared so regularly are missing for the first time since prices of dry plates and papers were put up so high.—Yours truly, H. Green.

BRITISH GELATINE.

To the Editors.

Gentlemen,—In reference to what has recently been said of the war achievements of photographic manufacturers, we feel that we are justfied in writing to you on what we consider to be a very important subject.

In addition to ourselves there is only one firm of English emulsion gelatine makers in this country, and previous to the outbreak of war manufacturers of dry plates, papers, and films obtained their principal requirements of emulsion gelatine from the Continent, especially Germany. Since 1914, when the importation of enemy goods was prohibited, the English photographic firms have obtained their supplies from ourselves and our only English competitor. We are sure you will appreciate the fact that if the two firms had not been in existence the photographic firms would have been placed in a very serious position; they would have had large numbers of orders to execute for the R.A.F., the Admiralty, the War Office, the Medical Supply Department, the India Office, and other Government departments, but where the necessary gelatine would have come from would have been a very difficult problem, as the French emulsion gelatine manufacturers had more than they could cope with in keeping the home trade supplied.

You have commented several times in your journal on every branch of the photographic industry but ours, which, unfortunately, you have passed over, through inadvertence, no doubt.

We feel that in justice to ourselves and to our only other competitor that some recognition of our services to the trade in a time of great difficulty would be some sort of compensation for all we have endeavoured to do during the past four and a-half years, in helping the photographic manufacturers to supply the demands made on them, and thus, in an indirect way, assisting to bring the war to a successful termination.

Trusting you will give this matter the publicity it deserves, we are, yours faithfully, for and on behalf of the British Gelatine works, Limited, L. J. Henry, Secretary.

London, January 25, 1919.

LENS REPAIRS: A WARNING.

To the Editors.

Gentlemen,—Many who have had cameras put aside "for the duration" or until a return to civvies became possible and Dora dead and buried, are now getting their cameras ready for the good time that we are led to believe is to come. To such workers—who invariably do small camera repairs—a word of warning is, I think, necessary.

Most of us know by experience that lenses often stick very tightly in their mounts, or mounts in their flanges, and refuse to be loosened, lenses mounted in aluminium being, as a rule, the worst offenders. Dodges galore for unscrewing stuck lenses have been published, all of which methods may answer well enough with lenses in mounts of brass, but any attempt to use undue force with modern aluminium mounts may lead to disaster because of the peculiar nature of the material.

Iris stops also have a nasty habit of becoming fast and immovable if put aside and not used for a time, particularly if the leaves of the iris are made of vulcanite or similar fragile material; in no case is it advisable to attempt to twist unduly any iris diaphragm that has become quite fast or even very stiff. I have also found that few dealers who undertake camera repairs will take in hand a tightly fixed aluminium lens or one with fixed vulcanite stops, they invariably recommending the unfortunate owner of such lens to send it direct to the makers, and even the latter have been known to fail.

Only this week I have a letter from one of our best-known lens makers to whom a fixed lens was sent for removal—a very costly aluminium objective which a dealer refused to handle. The letter states that the lens cannot be returned in two days, as promised, but that the lens will be returned in about a fortnight, they accidentally smashing the lens in their attempt to unscrew it. The moral of this tale is obvious, for if the makers with their correct and special tools cannot do the work of unfastening a stuck lens without injuring it, it is certain that we professional photographers cannot, so perhaps your readers who find themselves with fixed lenses or iris diaphragms of a more or less brittle character will take warning.—Yours faithfully, GODFREY WILSON.

THE ASSISTANT QUESTION.

To the Editors.

Gentlemen,—I trust that every encouragement and support will be given to Mr. Marcus Adams in his excellent suggestion upon the Assistant question. Let every assistant who values his future welfare immediately communicate with Mr. Adams, so that a complete register can be compiled of all assistants. The record and ability of each assistant can then be registered, giving some idea of their capabilities.

A register should also be made of all studios, so that assistants, when taking up new engagements, will have some idea of the class of work they are going to.

Many an assistant has taken a long journey, at great expense, only to find himself in a business of the "cheap and nasty" type. If he had been able to apply to the proper quarter for particulars this disappointment and expense would have been avoided. The establishment of a governing body will be beneficial to both masters and assistants.

It will also be the first step towards settling many other vital questions which affect photographic assistants. Let all unite; it is the duty of all to try and better the conditions under which we work.

I would urge all assistants to point out to their fellow-workers the importance of taking an interest in this great question. They should send their suggestions and opinions to Mr. Marcus Adams, 29, Blagrave Street, Reading.—Yours faithfully,

ALFRED E. J. THOMAS.

2, Brighton Road, Cheltenham.

To the Editors.

Gentlemen, The correspondence lately appearing in this "Journal" under the above heading is becoming both interesting and instructive, inasmuch as one sees the heartening sign that assistants are beginning to wake up and take notice, also that their ideas and requirements, individually and collectively, are being circulated generally and openly brought forward for discussion.

The subject of the relationship between employers and assistants is one that some years ago I introduced at a meeting of the P.P.A. during a Congress Session, and at the time my remarks were listened to with, I believe, some considerable sympathy. The prevalent opinion on that occasion, however, was that assistants as a body were somewhat apathetic, or that probably they had little to complain of. One of my points was with respect to specimens of assistants' work, a matter to which I hope to refer again, with the permission of the Editors, at no distant date, making certain propositions which I feel will be practical and beneficial to both employers and employed.

To regulate matters between the two, however, appears to be a somewhat difficult problem, if one seriously notes the variety of complaints brought forward in the recent letters to the Editors by more or less aggrieved assistants, but personally I consider the task far from hopeless if properly grappled with.

That it can be satisfactorily taken in hand is certain, and that the Council of the P.P.A. are anxious and willing to render every assistance in so doing is a fact of which I am absolutely sure.

A sub-committee of the Council has been recently formed, and through my friend Marcus Adams has issued an invitation for opinions and suggestions for the benefit and welfare of assistants from anyone and everyone interested; with what success we shall be notified in due course, I have no doubt. Possibly Mr. Adams may be somewhat discouraged to begin with, but he and his co-workers on this sub-committee are men of perseverance and optimism, and will not go under without a struggle, once having started upon the course.

There is a saying that "The gods help those who help themselves." Assistants are evidently desirous of doing *something* for themselves, and if that something is done in the right manner and in the right spirit it will be to their advantage and to the advantage of their employers also.

It therefore seems to be a question of procedure, and my own opinion is that individual effort on the part of assistants, in various ways I may propose later, will be of far greater value than any combination, which has been frequently suggested, without it be a combination of principals and employees, a federation I would look upon as being both practical and ideal. A "Union of Photographic Workers" may sound very well and look important on paper, but to my mind, in the present state of events, its creation is both unnecessary and undignified—undignified because it has been suggested by a correspondent, "W. E. B.," referred to below, that such a combination I might advocate should act if "an employee be dismissed against his desire," and unnecessary because no decent employer would, without grave financial reasons or others equally urgent, wish to dispense with the services of a good capable assistant without an effort to secure for him or her another good berth.

This correspondent also proposes that assistants should pass an examination to qualify themselves for a minimum wage. Such a procedure was inaugurated some years ago, and a scheme of three grades, I believe, worked out, but the response was so very, very limited that the whole thing fell into desuetude, and was finally abandoned.

Photography is a strange—er—profession. It is a good one if only that it tends towards the artistic, and artistry in all forms is elevating.

But what degrees we have in photography—and photographers? For one thing it would be interesting, as I remarked at the Congress meeting above referred to, to know how many men practising photography as a business at the present time were duly apprenticed, and how many were not. It is probably to one of the latter portion of the fraternity that the correspondent "W. E. B." (issue January 10, "B.J.") alludes when he remarks in his letter, "No thanks to the employer to whom he was apprenticed," when complaining of indifferent wages.

There are many photographers as professional men who were, like myself, formally apprenticed, and who love photography for its artistic possibilities; there are others who have not, as we might say, been legitimately articled who see the purely commercial side only, but it is up to the would-be apprentice, or his friends, to use discrimination at the outset and not get bound into such businesses. Here I am hopeful that the P.P.A. will in time be useful to beginners, with respect to its insistance on certain and perhaps rather more stringent qualifications on the part of its members.

So much for the employer. Now what about the assistants? Do they help themselves as a body by attending classes in art or chemistry? How many recognise the utility and helpfulness of one or the other or both? How many of our young retouchers—and old ones for that matter—know anything of facial anatomy? So many of them can "work up" a negative with a beautifully fine stipple, and at the same time bring every bit of modelling out of the face, eliminating character and thereby nullifying much of the conscientious work of a skilful operator in the studio.

Do some of our printers and dark-room assistants know the meaning of chemical cleanliness, or even *ordinary* cleanliness, in connection with their work? Some admittedly may have indifferent surroundings, but if that be the misfortune and not the fault of the employer there is an opportunity for a good assistant to make his presence felt and valued more highly.

The crux of the situation, then, is, to my mind, the urgent necessity of helping each other, and I firmly believe that events of the last four or five years, although in some respects deeply deplorable, have shaken things up in photography, and that photographers, both rank and file, are ready for the "goods the gods provide," and to take every advantage thereof.—Yours,

Leicester. FRANK BROWN.

Answers to Correspondents.

SPECIAL NOTICE.

In consequence of general reduced supplies of paper, as the result of prohibition of the importation of much wood pulp and grass, a smaller space will be available until further notice for replies to correspondents.

Moreover, we will answer by post if stamped and addressed envelope is enclosed or reply: 5-cent. International Coupon, from readers abroad.

The full questions and answers will be printed only in the case of inquiries of general interest.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

L. J. Bennet.—The silver image is converted into silver chloride plus some chromium compound, which remains attached when the haloid salt is reduced by the redeveloper.

M. P.—The lens is the ordinary or Petzval type of portrait combination for cabinets. The equivalent focal length is about 11 inches, and the aperture between f/3 and f/4. The list price was £9 15s.

P. W.—The nearest publication is the "Photo-Revue," issued at present fortnightly from 118 and 118a, Rue d'Assas, Paris (VIe), price 25 centimes (about 4d., including postage). The latest issue is that of January 15.

A. J. H.—We cannot say whether the numbers referred to of the Journal are still obtainable, but the Secretary of the Society of Chemical Industry, Central House, 46 and 47, Finsbury Square, London, E.C.2, will give you particulars. To non-members of the Society the price for single current copies is 2s. each.

C. F.—The gum-water spray on your coloured work is pretty certain to cause some amount of running. Why do you not try it on a small piece of work? The usual method of brightening enlargements in this way is by the use of a fixative varnish, such as you can get from the Aerograph Company, 43, Holborn Viaduct, E.C.1.

A. C.—We do not think that you can do better than to get a f/5.6 anastigmat of about 8½ ins. focal length. This should do all the classes of work you mention. We cannot specify any particular make, as practically all the well-known varieties are of first-rate quality. If you purchase a second-hand lens be sure to get it on trial first.

M. E.—There is no book on the subject. A very comprehensive article on half-watt lighting appeared in the "B.J." of October 26, 1917; the issue is still obtainable from our publishers, price 4½d. post free. The General Electric Company, 67, Queen Victoria Street, London, E.C., supply the lamps; they will send you their catalogue on application.

W. M.—Any ordinary large looking-glass placed on the floor to reflect the light upwards will answer the purpose. Pull a couple of lamps down as far as they will come so that the light does not have to travel too far, or the exposures will be very long. You may have a little diffused light in the studio, but the principal light must come from the mirror, and this should be almost direct, i.e., not diffused.

F. H. S.—The only book on tinting is "Colouring Photographs and Lantern Slides," by R. Penlake, price 1s. 6d., from Messrs. Iliffe, 20, Tudor Street, London, E.C. You will get also some useful hints in the directions for their use issued with the set of dyes by Mr. A. V. Godbold, 98, St. Asaph Road, Brockley, S.E. For terms for postal lessons you should apply to Photographic School, Regent Street Polytechnic, London, W.

B. H.—The method used by commercial sellers of old negatives in order to clean off the emulsion film is to dip the plates in nearly boiling solution of caustic soda. This removes the emulsion very quickly, but we know of no method sufficiently rapid which would enable you to recover the silver or the gelatine. The latter, we think, would not be of any commercial value, and, in fact, it is usually considered that the emulsion remaining in gelatine negatives is not worth recovering.

W. W.—The easiest rule we can give you is as follows:—Imagine a distance in front of the lens equal to one focal length, and a similar distance behind it also one focal length. Then, if in photographing an object at any distance the image is 1/n the linear dimension of the object, there will be n focal lengths in the space between the object within the imaginary focal length in front of the lens and a distance of 1/n focal length between the image and the imaginary focal length behind the lens. This relation of n and 1/n for n times reduction should enable you to carry out any necessary calculations.

R. M.—The prints appear to be made on collodio-chloride paper and toned with platinum, the formula for which is given with the paper. Seltona or Paget self-toning paper will give this result. Nearly this tone may be obtained by using a salt solution and a very strong hypo solution on either of these two papers. We know of no toning bath that will give quite this result on bromide paper, although Kosmos Vitegas very slightly toned with liver of sulphur comes very near it. The prints should be taken out of the toning bath as soon as any change is apparent, as the colour gets warmer in the washing water. Illingworth paper also gives a purplish tone with liver of sulphur.

C. A. W.—(a) We should prefer to stick absolutely to the maker's formula. We think it is unwise in view of the cost of Autochrome plates to endeavour to economise to the extent of a few pence in making up the developer. (b) It is near enough to use .880 ammonia instead of .920. (c) Dianol is similar to amidol, and should be used in preference to a paramidophenol developer such as azol, though no doubt the latter would serve for redevelopment. (d) We cannot say from experience. The best plan is to keep within 60 and 65 degs. F. (e) No objection to using metabisulphite instead of bisulphite in the fixing bath. Use formula given in the "Almanac." (f) Of no material effect. (g) It can be used. (h) The acid silver method is preferable on account of its continuous action, and of its facility for stopping intensification precisely at the stage required. (i) A mistake to depart from the regular formulæ. We should be very loth to risk developing Autochromes together by tank.

The British Journal of Photography.

IMPORTANT NOTICE.—Advertisers are requested to notice that the prices printed below represent an

Increased Scale of Charges,

which is now in operation in respect to all line announcements.

Since advertisements cannot be inserted until fully and correctly prepaid, senders of line announcements are asked to bear in mind this revised tariff. They will thus save themselves delay in the publication of their announcements.

Net Prepaid Line Advertisements.
Increased Tariff of Charges.

12 words or less	1/-
Extra words	1d. per word.

(No reduction for a series.)

Special Note. Adv'ts under a Box Number.

"Box No." and office address	charged as 6 words.
For forwarding replies add ...	6d. per insertion for each adv't.

If replies are called for this latter charge is not made.

Advertisements cannot be inserted until fully and correctly prepaid.

Orders to repeat an adv't must be accompanied by the advertisement as previously printed.

Advertisements are not accepted over the telephone.

The latest time for receiving small line advertisements is 12 o'clock (noon) on Wednesdays for the current week's issue.

Displayed Adv'ts should reach the Publishers Monday morning.

The insertion of an Advertisement in any definite issue cannot be guaranteed.

HENRY GREENWOOD & CO., Ltd., Publishers,
24, Wellington Street, Strand, LONDON, W.C.2.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3066. Vol. LXVI. FRIDAY, FEBRUARY 7, 1919. Price Twopence.

Contents.

	Page
Ex Cathedra	57
Economy of Chemicals	58
Practicus in the Studio. By Practicus	59
Patent News	61
Meetings of Societies	61
Commercial and Legal Intelligence	61
Forthcoming Exhibitions	61
News and Notes	62
Correspondence— A Correction—Purple Tones on Bromide—Are Materials Prices to Fall Soon?—The Assistant Question	62-63
Answers to Correspondents	64

SUMMARY.

In this week's article by "Practicus" the various methods of employing the electric light in the portrait studio are succinctly dealt with, simple instructions for installing arc and half-watt lamps being given. (P. 59.)

The price of materials and the assistants question are the principal subjects dealt with in "Correspondence" (P. 63.)

An interesting note on the troubles of Belfast photographers during the riots will be found in page 62.

The Lancashire and District Master Photographers' Association will have a dinner on February 25, and an exhibition of members' work on May 27. It is hoped that all photographers in the district will do their best to make these functions successful. (P. 62.)

Much money is yearly lost by wasteful methods of storing and using chemicals. Some hints on this subject which should be welcome at the present time are given in an article on page 58.

The possibility of making successful "living portraits" of private sitters with a suggestion for their display forms the subject of a paragraph on page 58.

A point of interest to assistants who expect replies to letters applying for positions is discussed on page 57.

Spots on prints, flashlight work, packing framed pictures, and combined developing and fixing are among the subjects dealt with in "Answers to Correspondents." (P. 64.)

A formula for re-developing bromide prints to a purple tone resembling gold-toned P.O.P. is given in a letter on page 62.

Failures in making the iodine-cyanide reducer, with instructions for obviating the principal difficulties, are dealt with on page 57.

The necessity for thoroughly washing bromide prints, an often neglected operation, is referred to on page 58.

"Colour Photography" Supplement.

The full specification of what promises to be an important step forward in the three-colour subtractive process, in which only two plates are needed for producing the three-colour elements, forms the major part of the Supplement this month. The patent has been granted to Mr. F. E. Ives and the Hess-Ives Corporation. (P. 5.)

Details of an imbibition process by means of which it is claimed that reproductions upon paper may be made by printing direct from a screen-plate positive are given on page 8.

Colour processes, including those of Drac and Herbert E. Ives, are described in "Decennia Practica" on page 7.

EX CATHEDRA.

Stamps and Box Nos. What is alleged by a correspondent to be a grievance amongst assistants who apply for situations advertised over a box number is the non-reply to such applications when a stamped and addressed envelope is enclosed for the purpose. It has been suggested more than once that the publishers of the "B.J." should devise some plan by which the grievance should be removed. Out of curiosity we should like to know of a plan which would achieve this end, for we can conceive of none but that which applicants have in their own hands, viz., to refrain from sending stamps for this purpose. In this matter it is necessary for an applicant to put himself in the position of an advertiser who receives a score or more replies to an announcement. Naturally the applications from those who seem suitable are replied to, but the general commercial practice is to leave the others unanswered. That being so, the enclosure of a stamped and addressed envelope imposes on the advertiser an obligation which he has not invited, and which, therefore, he may disregard. No doubt there are some employers who will reply to every application from motives of old-fashioned courtesy or from a wish to obtain a reputation for consideration, but the majority will never think of it. And the assistant may be asked to think that the enclosure of payment for reply will not in any degree improve the chances of his engagement. It is inconceivable that any business man will be influenced in his choice of an assistant by the fact that he is saved the cost of three-halfpence in communicating with him. On the other hand, he may very easily interpret the fact as evidence of nervousness or want of confidence on the part of the applicant.

* * *

Iodine-Cyanide. For some reason or other the compounding of this reducer of prints and negatives is the cause of more queries to us than is any similar preparation. The failures of which our correspondents complain may be roughly divided into two classes:—(1) Making the iodine solution, and (2) ensuring activity of the mixture. Failure under No. 1 can be infallibly avoided by working in a certain way; that of No. 2 arises from the varying strengths of commercial cyanide, and calls for adjustment by trial of the proportions of the two solutions. As regards the iodine, the secret of causing it to dissolve completely and quickly in the iodide is to add only just enough water to dissolve the crystals of the latter—scarcely more than required to cover them, for they are very soluble—and then to stir in the iodine flakes. These will dissolve almost instantaneously, and will remain in solution on diluting with water to the required volume. But if this latter is used for dissolving the iodide, the iodine is soluble in it only

by the exercise of an enormous amount of shaking or stirring, and usually cannot all be got to dissolve. In regard to the second point, inactivity in reducing power of the mixture of iodine and cyanide solutions is very often due to insufficient cyanide. The latter may be largely contaminated with cyanate which is inert in forming the reducer. Therefore, if the solution does not act as it should, further cyanide solution should be added; and if that fails, the solid cyanide is probably of too impure a quality, and a brand of guaranteed 80 or 90 per cent. should be bought. The reducer, of course, is not active unless containing a proper amount of iodine, which is used up in the treatment of prints, but, given that due proportion, want of energy in bleaching the silver deposit is occasioned by insufficient real cyanide.

* * *

"Close Up" Pictures. A little point which we have noted in several excellent cinematograph films is the very flat lighting in the large pictures of the leading actors and actresses. As most of our readers are aware, these are interpolated between the scenes in order to show more clearly the emotions which the character is supposed to be displaying. The effect is somewhat marred when the face is a ghastly white, and the make up of the eyes and lips the only visible things. That this is unavoidable cannot be urged, for we have seen some such productions which would vie with finished portrait work, and it would seem that the defect is only due to a neglect to arrange for the special lighting which is necessary for a single face. On looking at good examples of this work we have wished that it were possible to make portraits of private sitters in the same way. There would be, we are sure, a good market for them if they could be produced at a reasonable rate, and a satisfactory method of showing them devised. The ordinary projection apparatus is bulky and inconvenient, and cannot be readily used in daylight. Probably many of our readers remember the original Edison apparatus in which the films were inspected by means of an apparatus somewhat resembling a magazine stereoscope, the illumination being by means of an ordinary incandescent electric bulb. In this apparatus the film was in the form of an endless band, so that the episode could be repeated as often as possible without rewinding. Some time ago we saw a cylindrical film on which the pictures were arranged in a spiral somewhat like a phonograph cylinder. If this idea could be carried out in a satisfactory way it should become popular. There have been attempts to make home cinematographs working with glass plates, but these are too fragile and cumbersome to appeal to the non-technical public.

* * *

Print Washing. As a rule it is some little time before the presence of hypo in an imperfectly washed print becomes manifest, but sooner or later it makes trouble for the careless producer. With ordinary black bromide or P.O.P. it may be months, even years, before a general yellowing of the image or uneven patches begin to appear, but with sepia-toned bromides retribution is swift, for deterioration sets in before the work is finished, and sometimes the cause is not suspected, the paper, the bleaching solution, and even the sulphide bath being blamed, while the fault is due to improper washing. The great fact to be remembered is that Farmer's reducer is composed of ferricyanide and hypo, and that no matter in what form or for what purpose a solution containing these two chemicals is applied to a print the effect will be the same. We all know that when a print has been locally reduced the tone of the reduced part will be different from that of the remainder; sometimes only slightly and at others very noticeably Now a very small trace of hypo in a print is sufficient to react with the ferricyanide in the bleacher, and to start reduction of the image sometimes evenly and sometimes in patches or streaks. We have seen a batch of excellent prints which should have given excellent tones turn out a wretched ginger colour from this cause alone, and not only have the badly washed prints been affected, but properly washed ones have also been spoiled by the hypo conveyed into the bleacher by the former. Unless carefully watched many printers will trust to throwing prints into a large dish or sink and allowing a tap to run upon them, and if that tap runs for an hour they will say that the prints have been washed for that length of time. Failing a perfect mechanical washer there is no safe method of freeing prints from hypo except by hand washing, that is transferring the prints singly from one dish of water to another. Even as few as six changes of five minutes each in this way, provided that an ample quantity of water is used, will render prints safe for toning, and secure black ones from fading. There are two well-known tests for the presence of hypo, permanganate of potash and iodide of starch, and it would be well for anyone who is getting bad colours from apparently good black prints to apply one or the other. We know of one great firm which tests every batch of prints, bromide or gaslight, with permanganate, and the results are conspicuous for their good tone.

ECONOMY OF CHEMICALS.

When we compare the present prices of nearly all chemicals with those ruling before the war we find that the increase in the year's expenditure in this direction is a serious matter, and as it is a matter of percentages as serious for the small user as for the large one, whether the expenditure be five pounds or five hundred, it is important that full value be obtained for it, and this can only be done by keeping a watchful eye upon every stage of the work.

Very often waste begins even before solutions are made up. This is usually due to the want of proper receptacles for the stock when it is delivered. Quite often chemicals, such as sulphite and carbonate of soda, alum, and even ferricyanide are purchased in paper packages of twenty-eight pounds or less, and taken into use at once without putting into proper jars, the parcels being laid upon any convenient shelf exposed to the air and dust, besides often being scattered upon the shelf or floor. It certainly should not be necessary to allude to such a state of things, but it undoubtedly exists in many places, and should be stopped without delay. Next to this is the practice of guessing at quantities when mixing solutions, for in this way a loss of 10 to 20 per cent. may easily occur, especially in the heavier kinds we have mentioned. It is not necessary to weigh most chemicals carefully as a system of dry measurement is usually sufficiently accurate, but it is desirable to keep in each jar or cask a measure which will hold what may be called the unit quantity, so that any boy or girl may be entrusted to make up the usual bulk of solution without supervision. Nearly everybody makes up certain quantities of solution at a time. To take the case, say, of pyro developer, the jars holding sulphite, carbonate, and metabisulphite should each contain a vessel such as a jam-pot or one of the cardboard canisters now commonly used, which when filled to the brim and struck off level will hold exactly the quantity required for a Winchester of solution. The card canisters are convenient, as they may be cut down to the right depth with a penknife. The pyro itself is usually supplied in ounce bottles, so that no measurement is needed, but if purchased in bulk in the crystal form it should also be measured, or, if in the old resublimed state, carefully weighed. This should be done not only as

a means to economy but also as tending to uniformity of result. The same system should be applied to other solutions, such as amidol, hydroquinone, and such things as reducers and intensifiers, the only exception being when the stock solutions are saturated ones. With amidol developer the practice of making a stock solution of sulphite and adding the dry amidol as needed is an especially wasteful one, as there is always the possibility of using more than is needed, and, moreover, neither the mixed developer nor the sulphite solution keep in working order so long. The better way is to make a fair quantity of solution at once with the addition of metabisulphite as a preservative. A good formula is two ounces of sulphite of soda and a drachm of metabisulphite dissolved in twenty ounces of water to which is added a quarter of an ounce of amidol. This is diluted with an equal bulk of water for use, and will keep in good order for a week or more. It is frequently the practice to throw away amidol solution which has been little used, and although we do not advocate overworking it, it has been found quite practicable to keep used developer over from day to day, adding fresh as needed. In one studio the amidol was kept in a jug after use, and only thrown away when the excess of bromide rendered it necessary. The prints produced by this procedure were as good as most that we have seen. In this case we may say that no bromide was used in making the original solution.

A very common cause of waste is to be found in a hurried, sloppy method of working, by which much solution is carried away upon the prints, *e.g.*, when removing enlargements from the fixing bath. If a print is lifted quickly out of the hypo quite an appreciable quantity is carried into the first washing water, and at the end of the day's work the bulk is seriously reduced. With hypo at six shillings a hundredweight this is a small matter; at sixty shillings it is not. Even more wasteful is this practice in sulphide toning. Some printers waste quite half of the costly bleacher in this way.

Those who still work the gelatino-chloride or P.O.P. printing will find that the Eastman system of allowing a definite quantity of gold to a certain number of prints a very economical way of working, practically all the gold being used. For the benefit of those unacquainted with the plan we may explain that if a grain of gold be allotted to each dozen cabinets for a purple tone, by diluting the solution a larger number may be toned to brown or still more to a reddish colour, all the prints being put in at once and allowed to remain until the bath is exhausted. This not only saves gold, but ensures even toning.

Using an excess of solution for any purpose is so obviously wasteful that it hardly needs mentioning, yet it is frequently done. We have often seen three times the necessary quantity of ferricyanide reducer made up for cleaning a few bromide prints, while pyro developer is often used in a too lavish manner, especially when concentrated stock solutions are used. It is false economy to stint the developer, and many poor negatives are the result, but many assistants habitually use twice as much or even more than is really necessary.

Although not strictly within our subject, the waste of bromide paper through careless cutting or tearing deserves a word. One often sees prints with a margin nearly half the area of the finished print. This is not only wasteful of paper, but of all the solutions used. Odd-shaped enlargements such as eleven by seven upon twelve by ten paper run away with a strip which if trimmed off before exposure would serve for tests or even for small prints. All these little things mount up in a year, and even if the exact amount saved cannot be calculated the profits will appear appreciably better. Wartime orders are at an end now, and it is well to bear in mind the old proverb that a penny saved is a penny earned. There is another which says penny wise and pound foolish. The wise man will steer between these extremes.

PRACTICUS IN THE STUDIO.

ARTIFICIAL LIGHTING.

It seems only a few years ago that a photograph taken by artificial light was somewhat of a curiosity, and, with one or two brilliant exceptions, photographers were apt to regard it as a poor substitute for daylight, and, to tell the truth, the work generally produced quite justified their opinion. That I need hardly say was a time when electric mains were unknown, and the photographer who wanted to use the electric light had to instal an engine and dynamo in his cellar or else to burn "white fire" in a specially built lantern, the precursor of the modern flashlight. The plates were then much slower than modern ones and the candle-power of the light much less, so that there was a tendency to reduce diffusion to a minimum, and chalky faces and black shadows were the usual thing. I mention these old times because there are still many people who imagine that there must be something inherently different between a daylight negative and an artificially lighted one, and that the latter needs some sort of apology. This is quite a mistaken idea, and anyone who holds it should make up his mind so to improve his work that even an expert should not be able to tell the difference.

Before dealing with any of the types of installation which are now on the market, I should like to impress upon my readers that there is no essential difference between day and artificial lighting as far as effect is concerned—that is to say, that a top-light will give sunken eyes and hollow cheeks, a low side light will give the contrary effect, that an unscreened light gives the effect of direct sunshine, and that a well-diffused electric light gives much the same effect as ordinary daylight. This gives the key to successful lighting, for if the operator will carefully note the position of his dominant light when using daylight he can produce practically the same effects with any other illuminant if he places it in the same position with relation to the sitter.

The most important problem is that of diffusion, or one might say distribution, of the light, and the difficulty is greater or less as the original source of light is small or large; a single pair arc is the most difficult to manage and a battery of half-watts or small enclosed arcs is the easiest. Still the single large enclosed arc is not to be despised: I never feel unhappy with one at my command, therefore I will start my detailed instructions with this instrument.

The enclosed arc is an ordinary single pair of carbons enclosed in a glass cylinder so as to be practically airtight. The effect of this is that a much longer arc can be maintained. A long arc emits more violet rays than a short one, consequently shorter exposures can be given. Incidentally there is less consumption of the carbons, so that the lamp does not require much attention. An ordinary street lighting arc

enclosed in a ventilated globe is classed as an open arc and must not be confused with the enclosed arc properly so called. The difference between the various types of enclosed arc lamps is in the feed mechanism only and not in the light: with a given diameter of carbons and quantity of current you will obtain the same amount of light if your cylinders are kept clean. I have worked continuously with the Westminster, Jandus, and Aristo lamps, and have found them all satisfactory. I think I have tried every reflecting and diffusing device on the market, and have come to the conclusion that the simpler the arrangement the better. My shade or diffuser—call it what you will—is made of two wooden hoops about 36 ins. across connected by four laths about 45 ins. long. Round these are bent thin cardboards so as to make a cylinder open at top and bottom with one-third left open. The inside of the card is covered with dead white paper (if white cards are used this is not necessary) and the outside with dark paper or cloth. The open third is now covered with tracing cloth, and the whole attached by cords to the chain or shackle from which the lamp hangs. It is a good plan to fasten the tracing cloth with push-pins so that it can be easily removed when the carbons have to be renewed or the glass cylinder cleaned. If possible the lamp and shade should be adjustable for height, so that it may be lowered for sitting figures and for children, it being always remembered that a foot or 18 ins. difference in position may mean 20 to 40 per cent. difference in exposure. With this shade I have found no other accessories necessary, beyond an ordinary round head screen, which I nearly always interpose about halfway between light and sitter, leaving the lower part of the figure unshaded, and the usual white reflector. I have sometimes hung a dark curtain or vallance to the edge of the lamp-shade to avoid a glare into the lens, but this is not always necessary.

Open arc lamps are usually so fitted that only reflected light is used, the best known type, Marions Northlight, being very similar to the original Van der Weyde model, but fitted with several pairs of carbons to reduce exposure. The arcs are screened by a metal reflector on the sitter's side and the light reflected from the whitened inside of an umbrella about 4½ ft. in diameter. The surface of this may be regarded as a brightly lighted window, and any necessary diffusion provided for with the head screen already mentioned; the reflector is, of course, employed as needed. The highest type of work has been done with this system of lighting, the only drawbacks being a larger consumption of carbons and current than is necessary with the enclosed arc, while the large umbrella reflector takes up a good deal of space in a small studio.

Although there have been several other systems of arc lighting before the photographic public, the foregoing are practically the only survivors, and they will have a hard struggle for existence against the nitrogen-filled or "half-watt" lamps, which are making rapid headway as the simplest and least expensive of any system which has yet presented itself.

Before proceeding to these I should like to touch upon another form of electric lighting which has many good points: the mercury-vapour lamp. This is easy to manage, requiring no attention, and is economical of current, while owing to the large area over which the light is spread the lighting is fairly soft. Its one defect is its colour, which is greenish, and this gives anyone exposed to its rays a somewhat ghastly appearance. This can be overcome and the lighting improved by hanging a thin pink curtain in front of the tubes; this not only tones down the green but acts as a diffuser. As the tubes are somewhat long the lower part of the light tends to flatten the features somewhat, and I have found it advantageous to have the upright support lengthened, so that the bottom of the tubes are 4½ to 5 ft. from the floor. The tubes are rather fragile, so that care must be exercised in moving the apparatus about. Especial note must be taken of the connections, so that the polarity is never reversed, or disaster will follow. It is easy to make such a mistake if a wall-plug is used, and some means should be taken to make it impossible to put the plug in the wrong way.

The half-watt lamp as made for photographic work closely resembles the ordinary metallic filament lamps used for domestic lighting, but is much larger than these usually are. Its distinctive feature is that instead of the interior being as nearly a vacuum as it is possible to get, it is filled with an inert gas such as nitrogen, which greatly retards the volatilisation of the filament when the lamp is run at a high voltage. Most people know that if a lamp be run at an appreciably higher voltage than it is made for the light is rendered much more brilliant, but that the life of the lamp is shortened to a few hours or even a few minutes. Owing to their construction the half-watt lamps have practically the same life as the ordinary type, while the light is rendered white enough to enable short exposures to be made in the studio. The General Electric Company has devoted considerable attention to the photographic aspect of half-watt lighting, and send out not only suitable bulbs, but reflectors and stands ready for studio use. I have worked with several installations of half-watt lamps, and can recommend them to any photographer requiring a new installation. The lamps are made in various candle-powers from 500 to 3,000. I prefer the 1,000 c.p. as the best unit. If six 1,000 c.p. lamps be taken as the maximum power needed for ordinary work, these can be so spread out as to cover a considerable area and to give sufficient softness with very little loss of light by diffusion. If two 3,000 c.p. lamps were installed they would be as powerful as two arcs, and would have to be placed farther from the sitter and a thicker diffuser would be needed. The metal reflectors supplied by the company are convenient and a great protection to the lamp, but I have found the light rather too concentrated, and have always fixed a thin white nainsook curtain in front of them. They can be fitted with a counterbalance weight like a grocer's scales, so that they may be raised or lowered to any desired height. A cheap method of fitting is to make large D-shaped reflectors of white card with a front of nainsook. The most useful size is about two feet wide by thirty inches high for the nainsook front, and eighteen inches deep from the centre of front to the back. One must be careful to place the lamp well in the centre, as there is a considerable amount of heat from the lamp, and if too near either lamp or calico one or the other will be burned. Light weight tinplate can, of course, be substituted for the card for a permanent installation. I used the card lanterns for six months, and got one slight scorch only.

With regard to the arrangement of the lamps it is difficult to give precise instructions, and in accordance with my previous remark I recommend them to be placed so as to allow the light to fall upon the sitter at the same angle that daylight usually does. As it is undesirable to place them between the daylight and the sitter they should be placed on the dark side of the roof in the same position as the open portion of the light. If it be desired to light the same side of the face as with daylight the lamps should be placed towards the other end of the studio and the camera turned round. For average lighting the lamps should be fixed so as to rise to eight feet from the floor for standing figures and groups, and lower to about five feet six inches for sitting figures and children. The general arrangement may be in the form of a curve or L shape, one lamp being opposite the centre of the background and about seven feet away, another opposite the edge of the background and a little nearer to it, while two of the others are placed between these and two to serve as a side-light or for Rembrandt effects. Each lamp should be on a separate switch, so that only as many as may be necessary are burning at one time. It is very necessary that the *exact* voltage, not a nominal one, should be given when ordering lamps. Inquiry

should be made at the local power station, for a very slight drop in voltage means but little loss of light visually, but a great deal as regards the actinic value. In most cases where length of exposure has been complained of I have found this to be the cause. In districts where variations of current are common it would be well to use slightly lower voltage lamps than the nominal local voltage calls for, and to have the adjustable resistance supplied for these lamps and regulate the current as needed. PRACTICUS.

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Applications January 13 to 18:—

DARK-ROOM LAMP, No. 1,000.—Dark room lamp, which can be used as photographic printing apparatus. J. P. Hansen.

COMPLETE SPECIFICATIONS ACCEPTED.

These specifications are obtainable, price 6d. each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

COLOUR PHOTOGRAPHY.—No. 112,769 (January 15, 1917). The invention consists in a method of preparing three-colour composite photographs, in which one colour component is contained in one image and the other two distributed in a second mosaic image. The details contained in the specification are printed in another page in the "Colour Photography" Supplement. Hess Ives Corporation, 1201, Race Street, Philadelphia, and Frederic Eugene Ives, 1327, Spruce Street, Philadelphia.

COLOUR PHOTOGRAPHY.—No. 121,776 (Dec. 15, 1917). The invention relates to a method of producing positive colour photographs by means of colour screens, and has for its object so to utilise a layer or film of white pigment placed on a multi-colour screen so as to imbibe from the latter colours required for the photograph.—HANS PEDERSEN, 3, Istedgade, Denmark.

[The subject-matter of this specification is printed on another page in the "Colour Photography Supplement."]

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

SUNDAY, FEBRUARY 9.

United Stereoscopic Society. "Switzerland." A. T. Mole.

MONDAY, FEBRUARY 10.

Bradford Photographic Society. "Our Limestone Hills." R. Steele.
Dewsbury Photographic Society. "Photography and Art." E. R. Blakeley.

TUESDAY, FEBRUARY 11.

Royal Photographic Society. Ordinary Meeting and Annual General Meeting.
Halifax Scientific Society (Photographic Section). "The Transposition of Colour into Monochrome." J. P. Oakes.
Hackney Photographic Society. Slide Competition.
Chelsea Photographic Society. Annual General Meeting.
Manchester Amateur Photographic Society. Monthly Meeting. "The Romance of an Old Canal." J. J. Phelps.

WEDNESDAY, FEBRUARY 12.

Croydon Camera Club. "Toning Bromide and Gaslight Prints." H. S. Newcombe.
Ilford Photographic Society. "One Man Portfolio." R. Chalmers.
Dumbiston Amateur Photographic Association. "Pictorial Principles and Practice." R. Wallace.
Photomicrographic Society. Members' Evening.

THURSDAY, FEBRUARY 13.

Liverpool Amateur Photographic Association. "War Chemistry." H. R. Jensen.
Brighouse Photographic Society. "Tips and Dodges for Pictorial Workers." F. Whitaker.
Hammersmith (Hampshire House) Photographic Society. "The Western Highlands of Scotland." J. A. Anderson.
Hull Photographic Society. Members' Home made Apparatus. L. Kirk.
Rodley and District Photographic Society. Lantern Evening.
Wimbledon Camera Club. "Oxford." A. H. Verstage.

ROYAL PHOTOGRAPHIC SOCIETY.

MEETING held Tuesday, February 4, Mr. Charles Smith in the chair.

Mr. S. Gardner gave a very interesting lecture on "English Fonts from Saxon Times to the Sixteenth Century." Mr. Gardner possesses a wide archæological knowledge and argued out many disputative points connected with this subject.

An appreciative audience accorded the lecturer a hearty vote of thanks at the close of the meeting.

CROYDON CAMERA CLUB.

As the now Past President, Mr. A. F. Catharine, observed, "we come to another annual meeting after an interval of a year," which all will agree is hardly unusual. He retires, alleging that the reconstruction work of this country will unduly engage his attention. If he has undertaken the whole job, it will. The lofty traditions of the presidential office have been fully maintained by him, and aerated with a subtle humour. Mr. J. Keane again fills the post, and in expressing gratitude to his predecessor, fairly cleaned up the room with floods of oratory. Among other acknowledgments, the vote of thanks accorded the Council deserves mention, as it was passed in dead silence (out of respect). Fresh blood is added to more ancient gore, but not until fireproof paper is available to withstand the concentrated brilliancy can the components of the "Great Twelve" be resolved into a detailed list.

The Secretary, Mr. J. M. Sellors, to the great relief of all, continues to run the show, for certainly no better or a harder working secretary could be found. His report for the year showed everything on the up grade, including the rent. In customary sleuth-hound fashion he has managed to secure the new landlord as a "honorary member" at half-rates, the latter being one of those sensible individuals who take no interest in photography. He intimated his intention of attending the club at an early date, and doubtless will be carried out with all reverence. Deserves to be, anyway, for the club will be hard pushed to meet his modern views. The Treasurer, Mr. F. C. Reynolds, announced a profit of nearly £13 on the year's trading, and all wondered how it had been done, and who had been done. Mr. H. C. Inskeep has been O.K. in the refreshment department, putting its customers in the best of spirits, and (with watery reservations) *vice versa*. The proceedings concluded with a discussion on a proposed new rule, debated in a style which would have made even a theological argument sound calm and charitable by comparison.

A word to the vivacious moralist who runs the "Imperial Notes." At convivial Croydon meetings the members throw at each other neither brickbats nor bottles, despite his suggestion to the contrary. Let him understand that roses, or other flowers according to season, are projected through the air. This gay and festive writer will be wise if he continues to expand on potatoes or what not (present plate prices alone excepted) as a fitting introduction to dry-plates, and leave the C.C.C. severely alone.

Commercial & Legal Intelligence.

PARTNERSHIPS DISSOLVED.—Notice is given of the dissolution of the following partnerships:—(1) Between Nellie Constance Baker and Gladys Methven Brownlee, carrying on business as photographers, at 18, Charlotte Street, Park Street, Bristol, under the style of Gladys Methven Brownlee. All debts due to and owing by the late firm will be received and paid by Gladys Methven Brownlee. (2) Between Phyllis Pullin and Llewellyn Johnson, carrying on business as picture framers, etc., at 125A, Abbey Street, Nuneaton, under the style of Pullin and Co. All debts due to and owing by the late firm will be received and paid by Llewellyn Johnson.

FORTHCOMING EXHIBITIONS.

February 10 to 22.—Glasgow and West of Scotland Amateur Photographic Association Inter-Club Exhibition. Secretary, Gilbert S. McVean, 125, West Regent Street, Glasgow.

February 20 to 22.—Leicester and Leicestershire Photographic Society. Secretary, H. C. Cross, 80, Harrow Road, Leicester.

February 22 to March 8.—Edinburgh Photographic Society. Entries close February 13. Secretary, George Massie, 10, Hart Street, Edinburgh.

News and Notes.

Royal Photographic Society.—The following have been elected to the Fellowship:—W. Foster Brigham, Frederick Humpherson, Norman Frederick Horne, James Henry Jennings, Floyd Vail.

Royal Institution.—A general monthly meeting of the members of the Royal Institution was held on Monday afternoon, February 3. Sir James Crichton-Browne, M.D., LL.D., F.R.S., treasurer and vice-president, in the chair. The Chairman reported a bequest of £300 from the late Dr. T. Lambert Mears, who was a member of the Institution for fifty-three years, and a donation of £50 from an old member in celebration of his fiftieth year of membership. Mr. A. J. Walter, K.C., was elected a manager to fill the vacancy caused by the death of Sir Charles Norris Nicholson, Bart., M.P.

Explosion at a Photographer's.—A gas explosion, by which a considerable amount of damage was done, occurred last week at a shop and house in Sangley Road, Catford, recently taken by Mr. William Craddock, photographic enlarger. While Mr. Craddock and the workmen were engaged on the ground floor an explosion took place between the shop and the floor. Fortunately Mr. Craddock's wife and two children were away at a neighbouring picture palace at the time, and no injuries were sustained by the occupants of the place. Two windows were blown out, several ceilings were brought down, and the shop and house of seven rooms were damaged.

Difficulties of Photography in Belfast.—Although Belfast professionals managed to keep the flag flying last week it was, in most cases, in spite of unprecedented difficulties. The inconvenience of having no gas or electricity was added to by a coal shortage and an absence of lamp oil and candles, this latter being brought about by the general rush. A wintry daylight was made as much use of as possible, in one case being requisitioned to serve a "Pawl" strip printer! So far photographic premises have been fairly lucky in escaping the attentions of the crowd, though the iron gate posts outside Messrs. Thompson's studio were annexed while the caretaker was tied up, and the plate-glass window of Mr. J. Bell's establishment was smashed. Up to Saturday night there was no sign of better conditions.

Society of Master Photographers (Lancashire and District).—The Society will hold its first annual dinner on Tuesday, February 25, in Manchester. The officers and committee trust that all the members will do their utmost to make this function a big success. The price for tickets has been fixed at 7s. 6d. each. Ladies are cordially invited. Detailed arrangements are not yet completed, but it is essential that all who intend to be present should notify the Hon. Sec. before Monday, February 10. An exhibition of members' work will be held in Blackpool on Tuesday, May 27, 1919. A cordial invitation is also extended to all members of the P.P.A. who can make it convenient to attend on that date. Full details of the exhibition will be sent out by circular to every member in due course. The Sub-Committee appointed, Messrs. Bayliss, Foley, and Huish, together with the officers, will be grateful for any helpful suggestions and ideas for the exhibition, which may be forwarded to the Hon. Sec., F. Read, 14, Balfour Road, Southport.

S.P.E.S. Trade-Mark.—A copy of the regulations under which it is proposed by the Swiss Chambers of Commerce to establish a Swiss national trade-mark under the name of S.P.E.S. (Syndicat pour l'Exportation Suisse) discloses the fact that the mark will be confined to firms two-thirds of whose capital is Swiss, and to goods that are made in Switzerland exclusively by the Swiss. Thus any foreigners manufacturing in Switzerland will not be able to use the trade-mark for goods manufactured by them. The object of the trade-mark, it is stated, is not to place foreigners at a disadvantage, but to ensure that any articles bearing S.P.E.S. are to be really of Swiss manufacture. In addition, the mark is directed against German penetration, as numerous firms are known to be ostensibly Swiss, but in reality are German. The president of the Geneva Chamber of Commerce states that the control of these will not be easy, but the committee is alive to the probability of the improper use of the mark, and they consider that it will be necessary for Swiss manufacturers to bring cases of this character to official notice. No foreign firms are to be prevented from manufacturing in Switzerland; but not being Swiss, they are to be debarred from using the trade-mark. With regard to the possibility of the extensive misuse of the trade-mark by exporting merchants, it may be necessary to add the manufacturers' name to the trade-mark. This may not be acceptable to exporters, and if the suggested trade-mark fails, as a result, to protect Swiss manufacturers, it is considered probable that the Chambers of Commerce concerned will propose its abolition.

Correspondence.

**** Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

**** We do not undertake responsibility for the opinions expressed by our correspondents.*

A CORRECTION.

To the Editors.

Gentlemen,—Will you kindly afford me the space to correct an error that occurs in the report of the last Council meeting of the P.P.A. in your January 31 issue. In reference to the Government demobilisation scheme it is printed that the scheme afforded *an* opportunity for the Association to do more to secure release than could be done by the man himself. It should be *no* opportunity. —I am, etc.,

Alexander Mackie, Hon. Secretary.

89, Albany Street, February 1, 1919.

PURPLE TONES ON BROMIDE.

To the Editors.

Gentlemen,—On reading your reply to "R. M." in "Answers to Correspondents," I gather that he or she was inquiring for a purple tone on bromide paper.

The formula given below will give an excellent purple tone on any make of bromide paper, which is equal if not better than any gold-toned P.O.P. or self-toning paper. Thorough washing after each operation is required.

Bleach in :—

Potass. ferricyanide	140 grs.
Ammonium bromide	180 grs.
Water to make	10 ozs.

Wash and re-develop in :—

A.—Hydroquinone	170 grs.
Potass. metabisulphite	90 grs.
Potass. bromide	20 grs.
Water to	10 ozs.
B.—Ammonium carbonate	1 oz.
Water	10 ozs.

Equal parts of A and B.

Perhaps this might be useful to your readers.—Yours,

E. Manley.

Earlswood, Hockley Heath.

ARE MATERIALS PRICES TO FALL SOON?

To the Editors.

Gentlemen,—Your correspondent Mr. H. Green, in his "Writing on the Wall" predictions, *re* the fall in prices, is fully entitled to the optimistic views he sets forth, but the chuckle at the withdrawal of Government contracts from the photographic houses may be premature if he looks for an early fall. He admits he has never marvelled at the great increase in prices, and by that I conclude he understands something of the laws of supply and demand and its natural effect on prices. If he is a professional he has not suffered on returns compared to pre-war days, and has no legitimate grievance. With the release of raw materials there are prospects of a fall in price, and the trade helps the buyer in this respect by accepting orders subject to ruling price at time of

despatch. As a "Man of the Road" one acquires certain characteristics, serious or jocular, each with his own particular style of selling talk. The representative of a first-class house with a full knowledge of the lines he is offering is more often welcomed and consulted than looked upon in the light suggested by Mr. H. Green. The writer is not given to begging or praying for orders; these come naturally through carrying the lines of our leading manufacturers, and the men carrying these not only build up their connections on the merit of those goods, but add laurels to their own personality.

HARRY HUNT.

15 Hillcrest Road, Acton Hill, W.3.

THE ASSISTANT QUESTION.

To the Editors.

Gentlemen,—I feel sure all the parties interested in the Assistants question will agree that you deserve much praise and many thanks for allowing the interesting letters on the above question to be published week by week. It's a very important matter, so should deeply concern everybody engaged in the profession, but many do not seem to realise to what extent it does influence their interest.

We are still open for suggestions and opinions. I have much more to express, but will leave it to a later date when all have spoken.

Again thanking you, yours very sincerely,

MARCUS ADAMS.

To the Editors.

Gentlemen,—I have been interested in the correspondence on the Assistant question in your columns, although I am sorry that I missed Mr. Adams's original letter, from which I believe it arose. I am rather sorry to gather from Mr. Adams's letter in your last week's issue that he is afraid that he cannot see his way to taking the matter up in a practical form at the present time, as in many respects it would seem a particularly favourable opportunity for dealing with a question of this sort, owing to the numerous changes which are taking place in the staff of photographic businesses as demobilisation proceeds.

Having frequent occasion to engage assistants, I have been impressed with the difficulty of obtaining really competent workers in any department, and with the entire absence of any definite standard of attainment.

I think this is no doubt due to the unsatisfactory system of training assistants, and to the almost entire absence of any facilities for technical education in photographic processes leading to a certificate of ability, such as exist, at all events, to a greater extent in some kindred industries.

So many photographers have taken up the business without any thorough knowledge or experience themselves that they are absolutely unfitted to train others, and when they take pupils or apprentices look on them, I am afraid, more as a means of obtaining cheap labour, and fail to realise their responsibility to give them a good training.

On the other hand, in larger and more efficiently managed businesses the work tends to become so specialised that it is very difficult for a learner to acquire a knowledge of more than one branch, and even then only the more mechanical part of the work.

He is greatly dependent on the willingness of the head of his department to impart more instruction than is absolutely necessary to enable him to carry out his more or less mechanical duties.

I think if the P.P.A. seriously took up the question of proper training and certification of photographic assistants in the various branches of modern photographic work they would be conferring an immense boon on the industry as a whole, and would gradually raise the whole status of the photographic profession, to the benefit not only of the assistants themselves but also to all employers.

So many employers appear to adopt what seems to me a short-sighted policy of paying the minimum wage, and offer so little inducement to their assistants to improve their position, that many, who might otherwise have been content to remain on the staff, are tempted to start in business for themselves, with inadequate capital and little or no business experience.

This almost inevitably leads to price cutting and other unsatisfactory competitive methods, which, while seldom providing them with a satisfactory income, must, to some extent, detract from older established businesses.

Hoping this matter will be taken up in earnest, yours faithfully,

G. E. HOUGHTON.

55, Fort Road, Margate, January 30.

To the Editors.

Gentlemen,—Having followed the present and previous correspondence on this matter, I am surprised at the lack of suggestions, practical or otherwise. If the following remarks of mine call forth a chorus of disapproval, the air will have been cleared a little and we shall be able to dispense with one idea of solving this problem. At the same time it may be of some practical use in assisting Mr. Marcus Adams to gauge the temper of those whom he is trying to help.

As an assistant, I have no sympathy with an assistants' union as opposed to any employers' association. I will not reiterate old, or introduce new, arguments here. That does not mean I do not wish to tackle them. I could do so later if necessary.

Very skilfully hidden away in Mr. Frank Brown's letter was the one vital point upon which so much depends, i.e., efficiency. This point needs very much consideration, and before any clear idea of what constitutes an efficient assistant can be determined, an acceptable standard definition must be adopted. That definition should be discussed, decided and published by the P.P.A. as early as possible. Each branch of assistants should be classified and with it the degree of skill required. Assistants not having attained that standard should rank as improvers or unskilled until they do attain it.

My proposition is:

(1) That the P.P.A. should be a professional photographers' association and not an employers' association only. All photographers to be admitted to membership on payment of subscription and be duly registered.

(2) That the employers' council remain as it is and continue to conduct all business matters.

(3) In addition, a secretarial office be established to collect and tabulate (a) all photographic employers, hours, class of work; (b) all photographic assistants, their branch and references; (c) all written general grievances and opinions for use of general secretary; (d) all available information relative to photography, including books and where obtainable; also the addresses of technical schools useful to photographers. Such information to be supplied to any member on request.

(4) The general secretary should attend the employers' council monthly for the purpose of laying before that body the general grievances and opinions as collected in the secretarial office. A full report of such meeting to be published in the B.J.P., or circulated in leaflet among the P.P.A. membership.

(5) Cases of individual grievances, as unfair dismissal, leaving without due notice, or any breach of contract, should be referred to the solicitors for the P.P.A. In all such cases these solicitors shall conduct the proceedings for the P.P.A. against the employer or assistant offending.

(6) All binding contracts between employer and assistant to be made through the solicitors above.

(7) The test of ability for an assistant should be his references. A new reference, when proved satisfactory to those concerned, to be signed by the general secretary and duly recorded in the secretarial office. Any dispute concerning the withholding of a reference, or the untrue or unsatisfactory nature thereof, to be referred to the solicitors above.

(8) The employers' council be invited to discuss and fix a schedule of minimum wages for each branch of assistants, and a copy of the schedule sent to every member of the P.P.A. and comments and suggestions invited. The schedule to be subject to further discussion and possibly amendment when the general secretary has collected the opinion of the majority on its merits.

These brief suggestions will, I trust, bring a new interest into this correspondence, and open out some of the tracks which have hitherto been unexplored.—I am, sirs, yours truly,

ROWLAND SAMMES.

Reigate, February 4, 1919.

Answers to Correspondents.

SPECIAL NOTICE.

In consequence of general reduced supplies of paper, as the result of prohibition of the importation of much wood pulp and grass, a smaller space will be available until further notice for replies to correspondents.

Moreover, we will answer by post if stamped and addressed envelope is enclosed for reply: 5-cent. International Coupon, from readers abroad.

The full questions and answers will be printed only in the case of inquiries of general interest.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

A. C.—The apparatus is supplied by Messrs. Walshams, Ltd., 60, Doughty Street, London, W.1.

S. B.—The material you require is sold by G. Palmer, 47, Gerrard Street, W., and Messrs. F. Wiggin and Son, 102-4, Minories, E.

R. K.—The Busch f/5.5 anastigmat was listed at £14 10s., and its present value we should say would be at least half that price. But you will be well advised to try the lens before actually purchasing it.

O. V.—Old studio cameras are not of much value, and we cannot, of course, give any idea of what yours is worth from the description you give, probably £2 to £2 10s. would be a fair price. The lens is by a good maker, but not of great repute in this country. It should fetch from £3 to £4.

P. M.—The spots may be due to particles of iron in the washing water, although when so caused they are usually blue. Try tying a piece of thin, close flannel or double calico over your taps. We note several spots on the unprinted piece of paper you sent, and have marked them. You might try making a print or two in another room where no chemicals are about; this may give a further clue. Do you mix chemicals in your dark-room?

B. O.—For the colouring of bromide prints and enlargements as it is professionally done by photographers there is no better book than Johnson's "Retouching," sold by our own publishers, price 3s. 4d. post free. There is no book specially on the colouring of miniatures with a photographic base, but Messrs. Winsor and Newton, Ltd., 37, Rathbone Place, Oxford Street, London, W.1, have a book on miniature painting which we should think would be what you want.

J. D.—We do not know what is added to ordinary flash-powders in the process of making those sold specially for Autochrome work, but the usual ingredients are barium fluorite or calcium fluorite, copper fluoride, and lithium fluoride. It is suggested that by suitable mixture of flash-powders containing these substances three-colour exposures may be made on panchromatic plates without a light-filter, but we should think that what is most probably done is that a certain proportion of barium nitrate is added to ordinary flash-powder and the lens provided with a compensating filter suitable for it.

T. W.—The Photostat apparatus, supplied by Messrs. F. W. Herbert, Ltd., Coventry, at prices ranging from £100 upwards, is a large installation for the rapid copying of documents. The latter are laid flat on an easel underneath a sheet of plate-glass, the lens, pointing horizontally above them, being supplied with a prism. The negatives are made on a special rapid colour-sensitive paper, a roll of which is held in a holder, and a portion which has just been exposed delivered by light-excluding mechanism into the developer. It is then taken out in ordinary dull light and put into the fixing solution.

E. R.—We are sorry that we cannot tell you of any absolutely safe method of packing framed pictures except in wooden cases. We have, however, received several safely packed between grids of thin wooden battens with thick paper inside and out. Perhaps the makers of stretchers could supply these, or you could make them for yourself. To avoid breakage by shock it is a good plan to paste cross strips of brown paper three or four inches wide upon the surface of the glass, from corner to corner. If common paste or dextrine mountant be used, either can be easily removed by damping. A starch paste should not be used, as it is difficult to remove when once dried.

W. D.—Much depends upon the colour of the walls of the two rooms, but if they are fairly light we should say that about ¼-oz. of powder if quite freshly mixed should be enough for the dinner and 2 ozs. for the ball. One hundred and twenty ft. is a long way for the light to travel, and with a less quantity only the nearer figures would get enough exposure. This is reckoning for the f/11, with which you ought to be able to manage. As you will have to look down you can swing out the top of the camera back, and this should bring the near and distant planes into focus at the same time. Be very careful in firing the flash that no curtains or inflammable matter is near it.

B.E.—The plates, which are of American manufacture, were largely sold by Messrs. Fallowfield, 146, Charing Cross Road, London, W.C.2, before the war, but we are unable to say whether the firm are still able to supply. The only developer-fixer formulæ we know is that which appeared in the 1914 Almanac, and is as follows:—

Soda sulphite, cryst.	31 parts
Hypo	248 ,,
Soda carbonate, cryst.	8 ,,
Potass. bromide	8 ,,
Water	800 ,,
Hydroquinone	20 ,,
Ammonia (sp. gr. 9,891)	45 ,,

C. T.—1. There is no absolute reason why bromide should be used in a tank developer, though most people find that a little, say, ¼ grain per ounce of developer, is an advantage in safeguarding plates from veil. 2. As a rule, halving the amount of water in which the chemicals are dissolved will approximately halve the time of development. 3. In order to make the iodine solution dissolve the iodide in just as much water as will cover the crystals and then add the iodine, afterwards diluting to the bulk required with water. 4. The sensitiveness of the Ilford new panchromatic plates is such that they can be used with very great advantage without a screen. The Autochrome screen is quite unsuitable for them, but the "Ensign" screen might be used, although the best screens for use with panchromatic plates are the "K" series of Messrs. Wratten.

The British Journal of Photography.

The Oldest Photographic Journal in the World.

PUBLISHED EVERY FRIDAY. ESTABLISHED 1854. **PRICE TWOPENCE**

TERMS OF SUBSCRIPTION, POST FREE.

UNITED KINGDOM.—One Year, 10s. 10d.; Six Months, 5s. 5d Three Months, 2s. 9d.

CANADA ... ... AUSTRALIA ... ... NEW ZEALAND ... ... SOUTH AFRICA ... ... UNITED STATES OF AMERICA SOUTH AMERICA ... ... INDIA AND FAR EAST ... ... CONTINENT OF EUROPE ...	*One Year.* Thirteen shillings (13s.), or 3 dollars 17 cents, or 16 francs 38 cents, or 6 roubles 15 copecks, or 9 rupees 12 annas, or 6 yens 30 sens.
FEDERATED MALAY STATES, BORNEO AND SARAWAK	5 dollars 57 cents.

HENRY GREENWOOD & CO., LTD., Proprietors and Publishers, 24, Wellington Street, London, W.C.2.

IMPORTANT NOTICE TO READERS.—Until further notice agents will supply the "B. J." to order only, as the acceptance of "returns" by a publisher is now prohibited by the Government. It is therefore necessary in order to ensure the regular delivery of the "B. J." each week to place an order definitely with a dealer, newsagent or bookstall clerk, or to send a subscription to the publishers.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3067. Vol. LXVI. FRIDAY, FEBRUARY 14, 1919. Price Twopence.

Contents.

	Page
Ex Cathedra	65
Appearances	66
Panoramic Photographs and Perspective. By C. J. Stokes	67
Practicus in the Studio. By Practicus	70
Home Portraiture	71
Progress of Pictorial Photography	72
Amidol v. M.Q. for Bromides	75
Showing Large Proofs	75
Exhibitions	75
New Apparatus, etc.	76
Meetings of Societies	76
Correspondence— Developer Poisoning—Washing Prints—The Mercury Vapour Light—British and German Lenses—"Cinematograph" or "Kinematograph"—The Assistant Question	78-79
Forthcoming Exhibitions	79
Answers to Correspondents	79

SUMMARY.

A paper on panoramic perspective, dealing with the arrangement of groups taken with such cameras as the Cirkut with a view to obtaining a straight-line rendering of a composition arranged diagonally to the camera, with the necessary diagrams, will be found on page 67.

In a leading article we deal with the moral effect upon the sitter of the appearance of premises and personnel of photographic establishments. (P. 66.)

A long interview with a prominent American pictorialist, Mr. Clarence H. White, in which he gives his views on the progress of pictorial photography in the United States, is reprinted on page 72.

A brief review of the various processes now available for printing from portrait negatives forms the subject of the "Practicus" article on page 70.

A suggestion for obtaining orders from large size negatives by showing reduced proofs from them is made in an American contemporary. When plate prices drop, some of our readers may perhaps adopt it. (P. 75.)

The temporary loss of memoranda which need immediate attention is a source of annoyance in many businesses. We describe a simple method of keeping such papers before the eye on page 65.

Developer poisoning, print washing, the assistant question, and the mercury-vapour light in portraiture form the subject of letters on page 79.

Many photographers consider amidol to be the one and only developer for bromide prints, but the claims to consideration of metol and hydroquinone are put forward with some cogency on page 75.

A warning to those who may be tempted to buy lenses at private auction sales is given on page 66.

Lens matters, line drawings from bromides, Autochrome work, and dry-mounters are with many others dealt with in "Answers to Correspondents." (P. 79.)

It is difficult to say anything new respecting home portraiture, but in the report of Mr. Foster Brigham's lecture before the Royal Photographic Society the subject is handled in a novel way. (P. 71.)

The removal of silver stains caused by incomplete fixation or damp sensitised papers is a subject of perennial interest. We give some notes on it on page 65.

An almost automatic outfit for taking identification portraits for factory passes, railway tickets, and the like is illustrated and described on page 76.

A list of the officers elected at the annual general meeting of the Royal Photographic Society will be found on page 76.

EX CATHEDRA.

Stained Negatives. We suppose that by far the greater majority of stained negatives which are sent to us for a diagnosis of the defect represent the result of incomplete fixation. Unfortunately a remedy for the brownish stain which is the product of insufficient treatment of the emulsion with hypo is an almost hopeless problem in comparison with such general stain which comes from development or even the patchy stains due to contact with a printing paper containing soluble silver. About the only suggestion which we can make for the removal or, at any rate, partial remedy of fixation stains is to intensify the negative with mercury and ammonia, or with Monckhoven's formula of mercury and silver cyanide. By either of these processes the yellowish stain is converted into a grey one of little printing value, and with the aid of a certain amount of local reduction of the intensified negative it is possible in some cases to arrive at a respectable result, but whenever circumstances permit of a second exposure being made, the making of another negative is the only remedy which should be thought of. The silver stains from damp paper are of rarer occurrence in these days of development papers, yet it may be added that a ready means of removing them is that of Mr. Harold Baker, of rubbing with Globe metal polish and then leaving for a sufficient time in a strong solution of hypo. This is a very much better and safer plan than the iodide and cyanide method, the drawback of which is that the solution attacks the image proper as well as the deposit of silver stain, and therefore calls for an exceptional degree of expertness in its application.

* * *

A Business Accessory. "A place for everything and everything in its place" is one of those maxims of our childhood on which too much importance cannot be laid in any business establishment. The waste of time and the mental irritation which arise from the inability to find something which "you know is there all the time" and is only hiding itself through some diabolical malice, are elements which one tries to eliminate from the day's work. Partitioning of drawers and cupboards and a system of labelling the places where articles in frequent use are to be put when they are finished with will go far to removing these causes of reduced output in the normal working hours. But the suggestion we have to make—and it is one of which we have proved the utility—relates to a means for preventing the straying of the odd messages and memoranda which are part of the machinery of any business. It is simply a place where notes that such-and-such an order is wanted urgently, or such-and-such a chemical is getting out of stock may be placed so that they cannot be overlooked; where, in fact, which is the important

thing, they will be looked for. In our own office routine, which calls for many reminders, this takes the form of a good sized board covered with soft cork lino and provided with a supply of push pins. These serve to fix in an instant any memorandum which needs to be displayed to view until it is dealt with. The board speedily becomes an institution to which one looks and which soon largely replaces verbal messages. It seems to us that good use could be made of one or two of these devices in businesses, such as that of photographic portraiture, where there is much reference from department to department.

* * *

Photographic Apparatus at Auction Sales. A short time ago we commented upon the advisability of intending purchasers of second-hand lenses being very careful to see that the lens offered to them in a certain mount was actually the instrument issued new by a particular maker. We recently heard of an experience in connection with lenses which goes far to point out the importance of the buyer knowing fully what he is purchasing. The case in point was an auction sale, and among other things, household furniture, etc., two lenses by a well-known maker were catalogued. A photographer whom we know attended the sale, and after having previously examined the two instruments to his satisfaction, though he was not aquainted with the particular type of lens, bid for and purchased them for what was a fair sum. Of course, a trial upon a camera was not permissible, and his surprise may be judged when upon testing one of the instruments very indifferent definition was given. At some trouble the photographer got a catalogue illustration by the makers of the lens, and upon comparing the plan with his own instrument he found to his surprise that one of the components of the original instrument was absent altogether, which fact was made all the worse because the maker had long ago suspended business. And at a time like the present no others would be likely to take on such a job as supplying the missing component, even supposing such a thing was possible. This note is penned as a warning against those who may be tempted to buy photographic goods at general auction sales, which do not admit of a proper trial of the instruments catalogued. Such may turn out the reverse of a bargain, and as a general rule the purchaser has no redress, since most auctioneers in their conditions of sale hold themselves under no guarantee against errors of description.

* * *

A Home-Made Camera Case. Now that any goods of leather are so expensive it may be of service to some if we refer to a case for the camera outfit which we saw the other day for the making of which the photographer had used a substitute for leather which yielded a solid and yet slightly lighter case than that material. The case was made of ordinary three-ply wood, with a division for the slides, and the lid was fitted with lap-over edges in the same way as the best leather cases are made. The inside may be lined with thick green baize or thin felt, obtained from any upholsterer in a large way of business, and fastened with small gimp pins obtainable from the same source. The outside of the case was finished with a covering of good waterproof canvas fixed in position with dextrine paste, obtainable at any shoe or leather sellers, the edges of the canvas being turned over and fixed in position with the gimp pins before mentioned. To the bottom, four "Domes of Silence" furniture castors were fitted to keep the case off the ground, and so to reduce damage by its being placed for any time on wet ground. The case was made for less than a quarter the cost of one in solid leather, and weighs a few ounces lighter than leather case of the same size. Provided the joints are firmly screwed there is nothing to fear on the score of solidty. Moreover, such a case allows a more substantial lock and hasp to be fitted than if the article were made of the ordinary stout leather.

APPEARANCES.

Some people say that "appearances are deceptive," and others that "the first impression is everything." Although these dicta are apparently contradictory, there is truth in both, and our present object is to point out how outward appearances react on the success of a photographic business.

In photography more than in most businesses the impression made upon a prospective sitter is of the greatest importance. A shabby exterior, a dark and uninviting approach, or a dingy, untidy reception-room will probably act as a deterrent to the better-paying class of customers. The visitor will go no further than to make an inquiry as to prices, and retire as quickly as possible. This fact is more readily realised by women than by men, and may account for the fact that many women have started successful studios, while men who could turn out better work have failed to attract patronage. To the woman the trimmings are of primary importance, and she starts fitting-up her premises with much the same idea that she has in furnishing a home—that is, to make it an attraction to others and a source of modest pride to herself. Now it is not necessary to go to work in an expensive manner to achieve this end; the only thing necessary is to start with some definite scheme, and to keep it in view throughout. As the first contact with the public is usually by means of the showcase or window, we must start with that, and endeavour to make it as bright and attractive as possible, and always keep it so. Many places have been opened with an imposing array of plush and gilding, which for lack of care has in a few months become faded and dingy, giving the impression that no business is being done; while others started on more simple lines have by constant change and scrupulous cleanliness continued to attract the favourable notice of passers-by. Supposing that we succeed in doing this, the entrance and staircase, where there is one, should be respectable and well cared for. Dirty walls, with the paint or paper peeling off, worn linoleum, and dirty windows do not lead people to expect clean, artistic work behind them. This can all be remedied at small cost, and should at once be done where such a state of affairs exists. Many old-established photographers have experienced a serious drop in their takings when a rival concern has opened near them, not because the work was better, nor even as good, but because it was put forward in a more attractive way.

The reception-room is often allowed to degenerate into a sort of rubbish store. Obsolete furniture from the studio, parcels received or ready for despatch, frames, and out-of-date specimens cover the tables and chairs and utterly destroy that appearance of daintiness and comfort which is so necessary to the production of a complaisant mood on the part of the visitor. One old photographer always called his reception-room the drawing-room, and always kept it quite free from business lumber. Even his specimens were kept out of sight until they were required, the comfort of his patrons being apparently his sole aim. Others have made their reception-rooms interesting and profitable by displaying paintings, rare furniture, and curios, which not only served to pass the time while waiting, but which were ultimately sold. While on this subject it may be worth pointing out that the personal appearance of the proprietor and his

staff should be as carefully looked to as the other decorative items. Photographers used to have a reputation for slovenliness, and it is to be feared that some still merit it. They should take a lesson from the jeweller and other tradesmen who have to deal with ladies, and not appear in frayed, chemical-stained habiliments, while their assistants should be trained to those habits of neatness in dress and person which are expected to be found in a good-class business. One lady photographer insists on a uniform style of dress on the part of her receptionists, but this is going a little too far. Still, it is better than a tawdry blouse and a faded alpaca apron, which have been seen in studios of some pretensions.

The studio is a workroom, and need only be kept scrupulously clean and free from unnecessary lumber. The camera and stand should be kept well polished even if of old pattern, and anything in the way of greasiness on the furniture avoided. Velvet and leather chair-seats need keeping in order, as a lady does not like to risk soiling a nice dress. We have seen a lady refuse to sit on a greasy-looking chair, while others doubtless shuddered when they did so. The fittings of the dressing-rooms should be inspected daily, combs and brushes frequently washed, and a white drugget kept ready for use for wedding and evening-dress sitters. If powder and cosmetics are furnished, the pots and bottles should be kept free from smears and dust; actresses may tolerate dirty "make-up," private sitters will not. Nothing succeeds like success, and if trade is quiet the world must never know, for people like to feel that they are patronising a fashionable establishment, even if they have to wait for their portraits. One of the most successful American portraitists has told how at the beginning of his career he found sitters were not so numerous as he had hoped for, so resolved upon a bold stroke. He filled his diary with imaginary appointments for a fortnight ahead, and declined sitters who would not wait for a vacant date. At the end of the period he had booked more genuine appointments than he had ever done before, and since then he has never looked back. When anything is difficult to obtain people are sure to want it, and when the sitters who had booked told their friends how terribly busy Mr. So-and-so was, they immediately felt that he was the right man to go to. Few British photographers would care to take such a risk as our American friend did, but it is well to keep up the impression that business is flourishing, and that it is only as a special favour that early delivery can be promised.

One little matter must not be overlooked, that of stationery. We receive many letters upon notepaper the quality and printing of which would disgrace a chandler's shop. When people contemplate patronising a self-styled artist they are apt to judge his artistic skill by the style of the communications he sends to them, and nothing is so detrimental as poor stationery. We do not advocate florid designs or bizarre colouring—the simpler the better—but the type should be artistic and the paper as good as we can get in these times. The money so spent will not be wasted. It is only invested, and will return increased a hundredfold before many days. The whole point is this—that the photographer must appear to have some self-esteem and confidence before he can expect the public to trust him, and therefore should make as good an all-round show as circumstances permit.

PANORAMIC PHOTOGRAPHS AND PERSPECTIVE.

The notes on panoramic photographs in a recent number of the "B.J." will no doubt have interested quite a fair proportion of readers; and in all probability many more will welcome some amplification of the subject. And as there appears to be very little literature on this fascinating phase of the photographer's art, the following notes are penned with the hope they may at least help the novice, even if they fail in the more ambitious desire to stimulate the production of a scientific treatise on the principles involved. The panoramic camera *is* a necessity: there can be no question of that, and although much good work can be done by joining up several ordinary photographs, there are cases where all the skill in the world will fail to make a presentable picture; and an example of this failure occurs when we have a view including railway lines in the foreground. At each join the lines meet at an angle; and as we are not accustomed to trains tracing pentagons and squares, we are offended by the view. In a panoramic picture of the same subject, the lines will appear as continuous curves; so we are not asked to imagine the impossible, and therefore the eye and sense are not offended. To the professional mind, no doubt, the big group is the most important class of work to which this camera can be put; and here it so clearly scores that no argument is needed. These groups, of course, are arranged in an arc of a circle with the camera at the centre; and the general perspective of the resulting picture may be likened to one taken with an ordinary camera and a very long focus lens whose axis is at right angles to the same group arranged in a straight line. Now, whatever carping critics may say, the man at the end of a panoramic group will be far better pleased than if it had been a wide-angle group; for he is in the same perspective as the man in the middle; and this will prove a blessing to the photographer who has to copy a single figure from a group for the purpose of enlargement, and alas! in very many cases, the only available source will be from one of those big military panoramic groups, and whatever consolation father, mother, or sister can get from the finished enlargement, it will be all the greater from the fact that their departed hero is delineated in true perspective, which would not be the case if the figure were copied from near the end of a wide-angle group.

The thing that is most objectionable about a panoramic view is when something that we know must necessarily be straight comes out in the photograph as a pronounced curve. There are two ways to avoid this: one is by the arrangement of the subject, as in the case of a group, or by the selection of the point of view. Now, in general, a horizontal straight line, except when it radiates from the camera, appears in a panoramic photograph as a curve; and, conversely, there is a certain curve which, when in a horizontal plane with the camera at its origin, will always appear as a horizontal straight line; and if we know the nature of this curve, we shall be in a better position to order the arrangements for any particular photograph we wish to take.

Let us take a practical example:—Fig. 1 is a diagramatic view of Ludendorff, on horseback, giving a farewell address to his troops; and perhaps adding a few words of advice and warning on the disastrous consequences of a complication of Prussian microcephalism and Asiatic beri-beri. In the ordinary panoramic parade photograph the men dwindle away towards each end of the picture, and form a strange curve that would remind a soldier more of some lamentable struggle

with the theory of a trajectory than of invincible, vandalic, martial glory—and also it offends all our ideas of perspective. And besides, perhaps, Ludendorff would not like it; he might think you were poking fun at him, and intended some sly allusion to "elastic fronts." The remedy is to get the valiant soldier to let you arrange the men; and to get this effect of straight lines vanishing to the horizon, as in Fig. 1, they will have to be arranged in the form shown in plan by the heavy line in Fig. 2. If we are using a 12-in. lens, and decide to have the finished picture about 40 inches long, the group will have to be included in an angle of about 180 degrees; because $12\pi = 37\frac{3}{4}$ nearly, which will allow just a little margin each end. If we further decide that the nearest 6-ft. soldier shall be three inches high in the photograph, and the one at the remote end of the line one-quarter that height, then, by the simplest arithmetic, the nearest man must be 24 feet from the camera, and the furthest one 96 feet; and, as the group is to include 180 degrees, these two men and the camera will be all on the same straight line. This is shown to scale in Fig. 2, where the position of the camera is given by o, and B and B' are the places of the end men. The setting out of the rest of the curve is quite simple if we remember that the panoramic projection of the horizon is a straight line, and every length of a panoramic photograph represents an equal angle or number of degrees; that is to say, if three inches at the end of a Panoram represents 15 degrees, then also three inches from the middle will represent exactly the same angle, and if the line B O, joining the men's feet in Fig. 1, is to be straight, the vertical distance between it and H O must diminish by the same *arithmetical amount* for each equal length of the picture; and as the distances from the camera must be inversely as the height of the figures, we have the clue to every point of the curve. Now, let us calculate the distance of the curve from the origin o for every 30 degrees. As the total fall in height is to be $3-\frac{3}{4}$, and 30 is contained six times in 180, then

$$\frac{3-\frac{3}{4}}{6} = \frac{3}{8} \text{ inch}$$

is the amount required; and in the table below the distances of the points are given in feet for every 30 degrees, while the heights of the image are given in eighths-of-an-inch, to avoid fractions and show better the regular decrease.

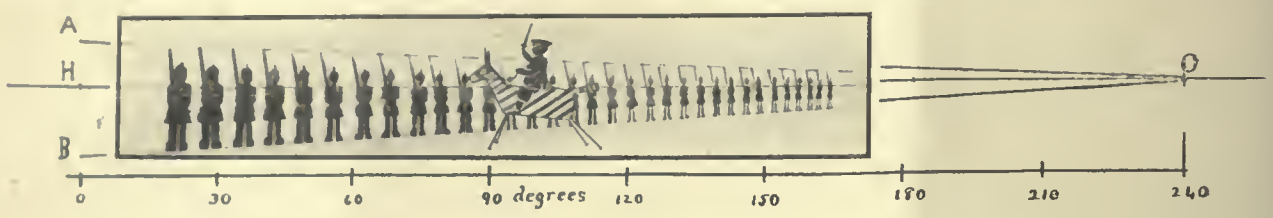


Fig. 1.

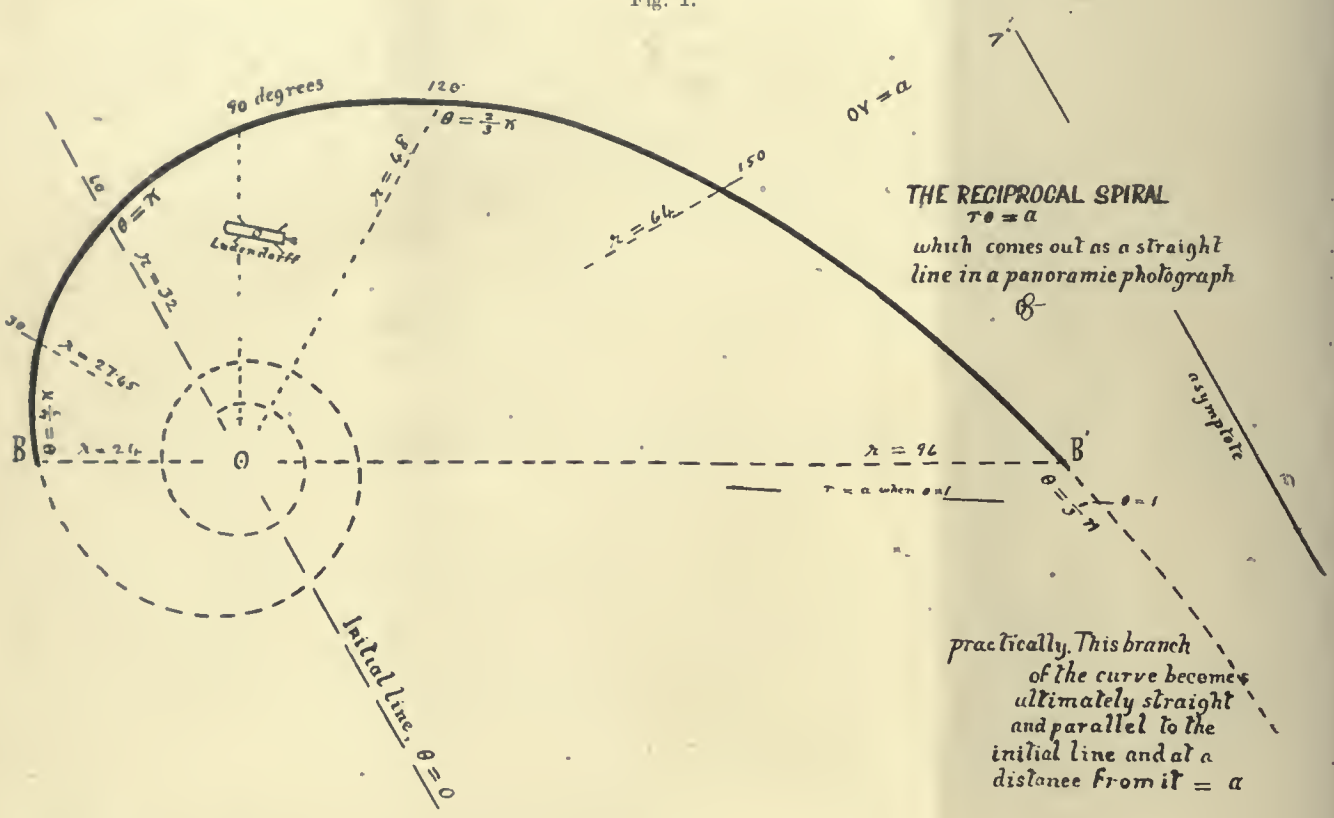


Fig. 2.

Degrees from point B.	Height of image.		Distance in feet.
0	24	24×1	$= 24$
30	21	$24 \times \frac{24}{21}$	$= 27.45$
60	18	$24 \times \frac{24}{18}$	$= 32$
90	15	$24 \times \frac{24}{15}$	$= 38.4$
120	12	$24 \times \frac{24}{12}$	$= 48$
150	9	$24 \times \frac{24}{9}$	$= 64$
180	6	$24 \times \frac{24}{6}$	$= 96$

In regard to this table it may be observed that the product of the height and distance is a constant quantity. A group arranged in this way will, in the resulting Panoram, have the same general perspective as Fig. 1, though, of course, each element of the picture will have the perspective peculiar to the lens with which it was taken.

Now, if the lines AO and BO are continued they will meet outside the picture, at the vanishing point O on the horizon; and if we call the vertical distance between A and B h and the number of degrees from H to O a, which in this case will be 240 deg., then for every degree the height will decrease by $\frac{h}{a}$; therefore, at any angle β, measuring from H, the height of the figures will be:—

$$h\beta = h\frac{a-\beta}{a}$$

and the distance from the camera to the curve at this point will be:—

$$r_\beta = \frac{ra}{a-\beta}$$

It will be seen that ra is a constant quantity, which we will call a; and $a-\beta$ is a variable angle, which we will call θ; then, substituting and putting r for the variable radius, we have:—

$$r\theta = a,$$

and, clad in this classic garb, readers who have dwelt in the seventh heaven of mathematical bliss will recognise an old friend, the "reciprocal spiral." To show the nature of the complete curve, it is continued in the diagram at each end by broken lines, and towards the origin it approximates more and more to a circle with every revolution it makes, according to the law—

$$r_n = \frac{a}{n\pi}$$

where r_n is the radius at the nth crossing of the initial line, and by taking a and n of suitable dimensions we can get as near as we like to any sized circle. By making a very small, the whole curve approximates to the initial line; and if we take it small enough we have the special case of the radiating straight line. Thus, from this spiral we can get in our photograph a right line at any degree of obliquity; and perhaps enough has been said to make clear the general law.

The panoramic projection of a reciprocal spiral in a horizontal plane with the camera at its origin is a straight line, and only this curve or some special phase of it is so rendered.

Before leaving this there is just one other thing the photographer would want to know the length of the portion of the curve he intended to use. From the equation we get the length of the part of the curve between θ and θ_1 equals:—

$$s = a\int_{\theta}^{\theta_1} \frac{\sqrt{\theta^2+1}}{\theta}\, d\theta$$

and integrating we have:—

$$s = a\left(\frac{\sqrt{\theta^2+1}}{\theta} - \frac{\sqrt{\theta_1^2+1}}{\theta_1} + \log_e \frac{\theta_1 + \sqrt{\theta_1^2+1}}{\theta + \sqrt{\theta^2+1}}\right)$$

where θ_1 is the higher value of the angle, and, of course, is measured in circular measure from the initial line, where $\theta = 0$. Applying this to Fig. 2, where our unit of length is the foot and $a = 32\pi$, we find the length from B to B_1 a little over 157 ft.

But in all probability it would be as difficult to get a photographer to look at a formula of this kind as it would be to get Ludendorff to let you arrange his men; so perhaps a better way would be to plot the curve to several values of a, then step out the curves and the radii with the compasses into equal lengths; and this would give a rapid approximate way of finding what one wants.

Before leaving this subject there are several practical points to consider. Where shall we put Ludendorff? In Fig. 1 it will be seen that the centre-line of the picture passes through the horse's head, and, therefore, he must be placed so that the mid-angular line—in this case the 90 deg. line—passes under the head of his charger. Another point to consider is what would happen if, instead of terminating the group at B and B^1, we continued it along towards the origin as far as the curve is

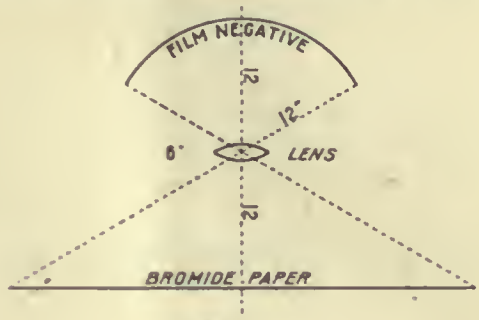


Fig. 3.

marked out in the diagram by the broken line, and also at the other end along the *straight* for half a mile or so; and then, starting the Cirkut camera at the beginning of the group, let it run round for two and a half revolutions? Still keeping to the 12-in. lens, we should want a 16-ft. film for this job; but to see the sort of thing we should get, draw a long rectangle to represent the picture (Fig. 40). The group will begin three times over and end three times, and if we draw a straight line from the bottom left-hand end of the rectangle to the horizon at the other end to show the line upon which the complete group is standing, the diagram will be completed by a line of 240 deg. and one of 180 deg. from the commencement of the picture and two lines of the same lengths at the end; and as these short

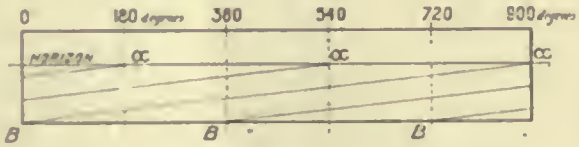


Fig. 4.

lines are necessarily repetitions of parts of the long one, all five will consequently be parallel to each other.

The practical outcome of all this is what every user of a panoramic camera knows: avoid such a position that gives a long, straight line, which in perspective ought to be parallel with the ground line; if we can get to something like 45 deg. from this position the curvature will, as a rule, be quite negligible; all radiating lines, and also parallels to these lines, if a fair distance from the camera, will be straight in the resulting panoram because, like the circle, they are special phases of our spiral.

A knowledge of the rigid conditions for a straight line will do the operator no harm, and even sometimes be helpful to the practical man.

When only a moderate angle is included in a panoramic view, it is not beyond the realms of feasibility to bring the picture into ordinary perspective by copying: the only conditions necessary being to bend the negative into the same curve that it had during exposure; and then project the image by means of a lens at the centre of the curve on to a flat surface normal to a line passing through the centre of

the curve and the middle of the negative. This is shown in Fig. 3, where we may suppose the negative was taken with a lens at 12 inches focus, and is therefore bent into a circular arc of 12 inches radius, and is being copied with a lens of 6 inches focus, which will give us a copy corrected as regards perspective, and of the same size as if the negative had been taken in the ordinary way with a 12-in. wide angle lens. Of course, the corrected copy will be longer than the panoramic view. In regard to the optical system, it is not at all necessary to have an anastigmat; some old-fashioned thing with a field as round as a football will do better; and perhaps a thin spectacle lens with a small stop right in contact with the glass best of all. Or, of course, the lens could be rotated during exposure; but then we should lose the advantage of roundness of field. Some years ago a lady took a picture of a castle in Scotland with an Al Vista camera, held so that the lens made a vertical sweep. The towers of the castle came out like barrels, but a correct bromide print was made in the way indicated above. A special optical system would have to be devised to cover anything more than a very moderate angle, and, in many cases, *true* perspective over a very wide angle would prove more objectionable than panoramic projection.

In the Cirkut camera we have great advantages: we can include any angle up to 360 degrees or more; we can focus; and we have usually three different foci to choose between; but, in the matter of range of time of exposure, it is the biggest sinner of all the panoramic cameras. The quickest exposure is literally too slow for a funeral, and the longest possible time you can give is too short for a dull subject on a dull day. In cameras of the At Vista and Panoram class, we could tackle ordinary hand-camera subjects on a bright day; and for a still subject on a dull day we could fix the camera on a steady stand and increase the exposure to anything we liked by swinging the lens to and fro as many times as necessary. And on some patterns of the Al Vista a brake, in the form of an air vane, was fitted, which not only increased the exposure, but also amused the group while it was being photographed.

In the matter of fitting new lenses to panoramic cameras this, in general, is impractical, except in the case of the Cirkut camera, where a new lens will mean also a new set of pinions, and the number of teeth to the pinions will be inversely as the foci of the lenses. There will be several points to attend to in making such a substitution, which are of more practical interest to the camera maker than the photographer.

In view of a recent patent for a camera in which the image is received on the inside of a cone ("B.J.," Dec. 27), it may be as well to define panoramic projection as used in the above article as the projection by straight lines from points on the object through the centre of a vertical cylinder on to the cylindrical surface itself; the intersection of these lines with this surface forming the image, which is afterwards viewed when the cylindrical surface is spread out flat to form the panoramic picture. C. J. STOKES.

PRACTICUS IN THE STUDIO.

PRINTING PROCESSES FOR PORTRAITURE.

I FIND that nowadays people are rather apt to get into a groove over their printing methods and apparently forget that any other process exists except that which they happen to be working. It thus occurs to me that a brief review of the different printing media at present available, with notes on the characteristics of each, would be of service to those who wish to vary their work.

The uncertain character of daylight in Great Britain has made bromide and gaslight papers very popular, and an overwhelming proportion of portrait work is now produced upon them, but thanks to the almost universal supply of electric current, we are not now altogether dependent upon daylight for what may be generally classed as "printing out" as distinguished from developing processes.

The quality of the negative is an important factor in the production of the print, and only a small proportion of current negatives would yield even a passable result upon the old albumenised paper which for many years was almost exclusively used, so much so, in fact, that a print was hardly regarded as a "real" photograph unless it was made upon it. By reason of the quality of the negative required, and because it was impossible to produce it by modern factory methods albumenised paper is now only a memory, and it is impossible to procure even a small quantity through the ordinary channels. Hence it is unnecessary to touch upon it otherwise than by way of a reminiscence. Bromide paper in its various grades has taken its place, and I therefore put it first upon the list as being the process for the million, or that proportion of it who practise photography.

Although in such general use, few portraitists fully appreciate the wonderful variety of surfaces, speeds, and character of emulsions which are available. I cannot fairly allude to any specific makes by name, but will be content to refer my readers to the advertisements in the B.J. Almanac, and the advertisement pages of the weekly Press. Bromide papers may roughly be divided into several groups, although these somewhat overlap each other. We may divide them by speed, that is to say, the time necessary to produce a print from a given negative by a given illumination; by the degree of contrast which can be obtained from the same negative by the surface texture, and by the colour of the paper base itself apart from the image. Thus we have "slow" and "rapid" papers, hard or contrasty, and soft, rough, smooth "platino matt," "satin," and glossy, these giving a range from rough drawing paper to a surface like glass. In many cases certain grades come into two or more of these classes. Thus we may have rough rapid, smooth rapid, hard cream and soft cream, and the same in white. In this great variety lies one of the principal advantages of bromide paper, for there is hardly a negative which is capable of being printed at all for which a paper which will give the best result cannot be found. Many printers use only one variety of paper, and trust to their skill in exposure and development to produce even results from all classes of negatives, but from experience I can assert that a very ordinary worker can produce a better result upon "hard" paper from a flat negative than an expert can upon the average kind. Therefore I advise every printer to have by him a small stock of special papers, so that he can at once select the quality necessary for exceptional densities of image. While not recommending this course to be carried too far and to encumber oneself with too many kinds, I would point out the influence of colour and surface in certain cases. Suppose that we have a hard, chalky negative; we can use for this a "cream crayon soft" paper. This not only reduces the contrast of the image but tones down the glare of the whites, while the slightly rough texture gives further aid

in the same direction. With a very soft negative we may choose a satin surface paper, that is, one with a semi-gloss, which gives a richness to the shadows. A full gloss paper would be even better, but for high-class work a glossy surface is rarely acceptable. Further modification may be obtained by toning the image to a sepia colour, a course generally advisable with harsh contrasts, as brown and white usually gives a softer result than black and white when both prints are of the same quality. I strongly deprecate the practice of toning bromides irrespective of quality; every day thousands of prints which are of fairly good quality in black and white are spoiled by being converted into poor, flat, rusty sepias. If I have the slightest doubt as to the resulting tone of a print I would leave it in black and white, and if the order were for sepia prints I would ask permission to submit a black and white print when sending the proofs.

Gaslight papers closely resemble bromide in the points I have already mentioned, so that it is not necessary to deal with them at length. I should like, however, to say that besides the "contrasty" qualities which are most used, there are special kinds which, though very slow in action, will give splendid results from dense negatives. These papers require a very strong light for printing, several fifty-candle-power lamps being needed in the printing boxes.

Gelatino-chloride or P.O.P. was not so long ago almost universally used for portrait work, but is now little in favour, especially among the cheaper class of studios. A few good class firms still find that the warm tones so easily obtained upon it are acceptable to their patrons, and wisely adhere to it. Certain warm browns and reddish tints closely approach the delicacy of carbon, and will always be popular, but the purple black tones are now quite out of fashion. P.O.P. requires much greater care and cleanliness in working than bromide, which may account for the latter superseding it.

Self-toning papers, which are mostly collodio-chloride, possess many advantages, although they are the slowest of the printing out sort. This defect may be largely overcome by employing an enclosed arc for printing, when the time is much shortened. A great range of tones from warm sepia to a blue-grey may be obtained by variation of the strength of the hypo bath and for the greys a preliminary soaking in a solution of common salt. Matt and glossy surfaces and white and cream bases are available in this class of papers. A variation of tone may be obtained by using a platinum toning bath as employed in the double toning of ordinary collodio-chloride paper. I have used much of this paper, and find that the prints stand very well. Some, which are fifteen or sixteen years old, seem quite fresh. Self-toning gelatino-chloride is also made, but I have not found so good a range of colours with them as with the collodion. Moreover, they cannot be dried by heat, as the latter can. Some few photographers have used what is termed salted paper for large work. This has to be prepared at home by coating drawing paper with a solution of chloride of ammonium or even common salt, and floating upon a bath of nitrate of silver. The prints may be fixed without toning, or they may be toned in any of the gold baths used for P.O.P. Strong negatives are required, as the image is inclined to be rather dull as compared with that on an emulsion paper. The surface is very agreeable, and with suitable subjects the results are highly artistic.

Platinum printing like carbon stands in a category of its own, and occupies the first place with those photographers who put quality before cost. It is, next to ferro-prussiate, the simplest of all printing processes, and is not only pleasing but permanent; it is actually a "thing of beauty and a joy for ever." Platinum papers can be obtained in rough and smooth surfaces, and on white and cream bases. As there is no practically useful method of toning, special papers and solutions are prepared for black and sepia prints respectively. One important quality of platinum prints is their absolute flatness when finished; as there is no coating either of gelatine or collodion there is no risk of curling, and if attached by one edge to a mount they will lie close to it no matter what the condition of the atmosphere may be. It should be clearly understood that the word "platino," when applied to bromide paper, refers to nothing but the appearance of the surface. There is no platinum in the coating, and the image is no more permanent than that on ordinary bromide papers.

Carbon printing is unique as regards the great variety of colour and surface in which prints may be produced. Although in portraiture only two or three are commonly used, such as sepia, red chalk, and warm black, at least fifty varieties of colour, including reds, blues, greens, browns, greys, and many others, and a score of different weights and surfaces in the transfer papers are regularly supplied. So that it is possible to make carbon prints which closely resemble those by any other photographic process; and, needless to say, all are absolutely permanent. It is worth noting that, in spite of war restrictions, the price of carbon materials has shown but little increase in price. Many are deterred from attempting carbon printing by the idea that it is very difficult, but this is not the case if ready sensitised tissue be used, and if the work be carried out systematically it is little more troublesome than P.O.P., and the extra price obtainable will amply justify the additional work.

I have carefully abstained from giving working details of any process, as this has been done over and over again, but in case of any difficulty, any desired information will be given through the usual "Answers to Correspondents" column. My object has been to point out what materials photographers have to hand for the production of such prints as may be needed for any class of business.

PRACTICUS.

HOME PORTRAITURE.

[In the lecture given before the Royal Photographic Society some months ago Mr. Foster Brigham gave from his wide experience many pieces of advice on the practice of portrait photography in the sitters' homes. Some of his hints were reported in our columns at the time, but we now avail ourselves of the opportunity of adding others to them by reprinting the official report of his lecture, which appears in the current issue of the Society's "Journal."]

No special apparatus was required: anything capable of making a negative could be used. Most of the portraits to be shown were made with a Goerz-Anschutz hand-camera, a particularly awkward instrument for the work, owing to the lack of a swing-back, a very necessary adjustment when there were perpendicular lines such as of panelling in the background.

The usual reason given for not indulging in portraiture was the absence of a studio. He had worked in various studios for fifteen years, and had found that there was something very conventional about a studio; one got a result which looked artificial, and artificiality was the antithesis of art. Photography was at its best when naturalistic. Most of the portraits he was showing that evening were taken in a room measuring twelve feet by ten feet and containing one window. It was said that the light should come only from one source, but he had found two or more windows a very great help. Some of the examples were taken in a transformed aeroplane packing-case with three small windows put into it. When going into other people's rooms for the purpose of taking portraits

it would be found that each room presented a fresh problem and a refreshing view-point.

One of the elementary rules of portraiture usually taught was that the background should be quite plain. This was a good, safe plan, but difficulties were not got over by going round them. Hanging committees and critics were apt to let rules of this sort run away with them. The young photographer was told, quite rightly, that he should not take a group in the sunlight, but if he were never to get beyond that he would not go very far. In the same way, in home portraiture, which might be regarded as any sort of portrait which was not taken in a studio, the background must be studied with some idea of going beyond the elementary. The background selected by the photographer showed fairly clearly the stage of development at which he had arrived. The first stage was that in which he placed the sitter against anything which happened to be handy, often an ornate wall-paper. In the second stage he used a painted conservatory or seashore background; and the third stage was that in which his background was quite plain. This last was now so much used that it had become a convention. The fourth stage was represented by a background worked-in in such a way as would assist the composition. Strong high lights as accents were daring, but if used with discretion in the right place they were effective. He showed illustrations of various kinds of backgrounds, and reminded the meeting that the old portrait-painters introduced something into the background to indicate the sitter's profession or calling. A self-coloured wall, panelling, or curtains, especially if draped to help the composition, or any real solid object free from distracting high lights or fierce contrasts, made the most natural pictures, and might be termed the fifth stage.

When the sitter was a personal friend one had something to say about his or her clothes. What was required was, in the case of a lady, simple clothes with flowing lines—not an easy matter with the present fashions! With regard to posing, it was true and rather trite to say that the best way to pose was not to pose. One tried to catch the characteristic deportment and expression that enabled a person to be identified a hundred yards away. It was very difficult to avoid the camera-conscious look, and a good way to do so was to get the sitter to perform some simple action. The question of pose was intimately related to that of composition, which might be defined as filling a space in a manner pleasing to the eye. There should be nothing in the picture which gave the suggestion of any part of it being insufficiently supported. Stability was of the very essence of composition: one of the most suitable general forms one could have, and one very easy to get with head and shoulder portraits, was that of the pyramid. The old painters were fond of combining the pyramid with the S line, as, for instance, Rubens' "Madonna and Child," and the well-known "Madame le Brun and her daughter," the composition of both being almost identical.

As soon as one got away from the pyramid or the diagonal form it was necessary to have holding-in lines—that is, other suggestions of support which would keep the picture fixed in its space. Judicious trimming would often supply these lines when the background did not provide them.

It was a difficult problem to fill an oval satisfactorily. One way was to have some lines in the picture which themselves partially conformed to the oval or a very bold head and shoulder portrait of pyramidal form could occasionally be trimmed in this way. As far as possible the light of the room in which the sitting took place should be used just as it was normally, without any window darkening. The longer he practised photography the more he felt that any lighting was good lighting so long as one got the tone values right. Many books had been written on the subject of lighting. Inglis, an American, who wrote one, said that the only system of lighting was his—*i.e.*, the light coming from a small square at an angle of 45 degrees from the side and front of the sitter. Another writer advocated the division of the room and light into a certain number of squares, and when a certain effect was produced and noted, that effect could be repeated at will. That was ridiculous, as the interior lighting varied with every change outside.

The photographer must school himself to see and appreciate lighting effects. If the play of the light and shade on the sitter's face could be properly appreciated, good lighting could be found anywhere.

In conclusion, he said that a portrait would not be satisfactory unless it indicated something of the character of the sitter, and it was very difficult to catch and record just that expression.

PROGRESS OF PICTORIAL PHOTOGRAPHY.

[A booklet of which we have recently been the recipients contains an interesting review of the present tendencies in pictorial photography in the shape of an interview with Mr. Clarence H. White, one of the prominent exponents of art through the medium of the camera in the United States, and the director of a school of photography founded for the purpose of providing systematic instruction in this branch of work. It is not so many years ago that Mr. White appeared before the British photographic public as one of the young men enthusiastic in establishing altogether new ideals and new forms in pictorial photography. The American school, as it was then styled, came in for a large measure of derision, but it has been easy to trace its influence in the exhibitions of pictorial work during the past ten or fifteen years. Equally there has been observed some abandondment of the more extreme features which characterise the early work of these American pioneers; and therefore it is interesting to have Mr. White's conspectus of a stage of progress in which he has taken a notable share.—EDS. "B.J."]

"Mr. White, I want to ask you whether you think that pictorial photography has made substantial, or any, progress in America during the past year?"

"I believe that pictorial photography is progressing, but its progress is not to be expressed in terms of a year. Pictorial photography is expressed more or less in terms of epochs. My observation is that there has been a big growth in—well, I cannot say exactly in a year, but in the last four or five years. I may say that this growth is evident even in places remote and in places where we once heard practically nothing of pictorial photography, but find now large groups of very active and earnest workers, most of them producing very high-class work."

"What has been the influence of the pictorial photographers of America on photography during the past year?"

"The influence has been one of substantial encouragement. For one thing, we have sent to various museums important exhibitions of photographs. Here is a little incident that came to me a few days ago that might help to answer your question. A young woman, a member of our organisation, was in the Cleveland Art Museum. While she was in the room where our photographs were being shown she saw the director approach with an English artist, and she overheard this conversation. As he passed the door the director asked the artist to go in with him and see the exhibition of photographs. The artist protested that he did not care to go in and that he did not believe in it, and that he did not think there was anything in pictorial photography. The director quietly insisted on his going in, saying that he felt very decidedly that there was more real enthusiasm manifested in this exhibition of photographs than there was in a group of etchings that was shown in another room. This is significant of a change of attitude toward photography as an art, and there are about sixteen different museums in which this state of things is being revealed. I have in mind the Newark Museum. They had a collection of these photographs displayed in a most beautiful way in the Newark Public Library, and along with it they showed copies of all known magazines devoted to the subject, with portfolios representing examples of the work

of photographers in Europe, and a person who came to view these pictures could then turn to these magazines or portfolios and study them."

"What effect would you say war conditions have had on pictorial photography?"

"In America the effect on pictorial photography has been, I would say, rather to dampen enthusiasm or to discourage it. There has been a feeling that all activities should be directly connected with the war, and that photography should share in this; that pictorial photography should be devoted to placarding the war or the spirit of the war, a sort of war propaganda, rather than purely pictorial work. Abroad, one of the interesting things I have noticed in connection with the catalogue of the Royal Photographic Society exhibition, the oldest photographic organisation in the world and the most important one, is that the exhibition reveals very little of war time activities. They are showing pictorial photographs, technical photographs, Autochromes, and every branch of photography. The pictorial section had no particular bearing on the war, nor had the Autochrome nor the scientific section. The section of forty-nine prints loaned by members of the British Military Service formed the only contribution directly pertaining to the war. In the advertisements in this catalogue there was practically no reference to the war, and an advertisement of a photographic school in connection with the Regent Street Polytechnic contained no mention of a war course, but did mention conspicuously their pictorial work."

"Has any development along the lines of what we might call cubistic art got into pictorial photography?"

"Yes, it has gotten into photography to a slight extent, but I am loth to call it cubism or any similar ism. The development of modern art, I think, is in the direction of construction; and construction—picture construction—applies to photography as definitely as it applies to painting and other art. Indeed, a great feeling of the need of this has expressed itself in connection with photography."

"What do you mean by the 'construction' of a picture? Anything different from the rules of composition as usually understood by artists?"

"The rules of composition as usually understood have been too narrow. We might say there are no rules, but there are certain fundamentals. These fundamentals have been made to apply in a great variety of ways. Take this print, for instance. [Mr. White took up a photograph showing some peculiar architectural effects.] Here is a little of what we might call cubism in modern photography. We first look at it, and we get pleasure from the play of light and dark on the object. It produces a sense of satisfaction to the eye, and yet when we examine it more closely we feel that the artist has violated the rules of what might be called composition. We must construct our rules of composition from examples rather than make the construction that is demanded by our art out of formal rules."

"Can commercial or professional photography assimilate pictorial principles?"

"I believe commercial or professional photography should be pictorial. Pictorial photography is simply a name applied to photography that really has, or should have, construction and expression."

"Has colour photography a future? Has the Autochrome a future?"

"I feel that the Autochrome has already demonstrated its position, and the colour print will eventually take a definite position. Processes will be simplified in such a way that it can be used more successfully by the amateur, and the amateur's work and enthusiasm are necessary to its development."

"Has platinum paper been in the market during the past year?"

"Black platinum paper practically disappeared from the market, but sepia platinum paper has been obtainable."

"What is the best substitute for platinum paper?"

"The British Journal of Photography, a recognised technical publication devoted to photography, has said that printing *de luxe* should be done on platinum or palladium, which are absolutely permanent papers. Carbon is also to be classed with these as permanent papers. There is no real substitute for these papers, and I trust that they will eventually be again available."

"What do you think of the bromide papers made on Japan tissue?"

"I think they have produced very beautiful results."

"Is bromide paper the best available paper of the future for pictorial effects?"

"Bromide prints are most beautiful, and the quality of some bromide prints that we see is such that it is difficult to distinguish them from platinum, which is surely the greatest compliment we can pay them."

"Can the bromoil process ever be used except by expert workers with a gift of patience?"

"I find that the bromoil process is often used by people who are not experts, but amateurs with a desire to achieve a good photographic result. To be an expert, of course, would help very materially in producing this result. There are very few expert bromoil printers."

"Has the 'gum print' passed? If so, what has taken its place as a medium of expression for workers who think they have something to express that is beyond straight photography?"

"I think the 'gum print' has not passed and is not likely to, but to become really of greater interest as time goes on."

"Are as many 'gum prints' seen in exhibitions now as formerly?"

"No. The reason, I think, is that some of the best workers in the medium are not interested particularly in showing their work in exhibitions."

Mr. White here turned to some choice gum prints that were hanging on the walls and pointed out their good points.

"Is carbon paper now used to any extent?"

"Carbon paper is still available, and is still used, but not so much by the commercial photographers, and probably a little less by the pictorialists, because of the introduction of new processes like oil and bromoil; but many workers have continued to use, and still use it, with admirable results."

"Has 'home photography' had any growth in popularity during the year?"

"Probably the greatest development of photography is in home photography or home portraiture. During the last five or six years practically every professional studio has been obliged to introduce home portraiture."

"Have there been any notable inventions in photography during the year?"

"I want to make a confession—the inventions in photography are not of so much interest to me as the development of the inventions that are still to be perfected."

"Has the so-called "fuzzy school' made any converts during the year, or is the tendency to go back to sharp, or sharper, prints?"

"I do not think there is a tendency to go back to sharp or sharper prints, but there has been, or there is getting to be, a better understanding of the soft focus lens."

"Has the pictorial school of photography had any influence on what may be called the chief field of photography, in its larger aspects, at present—the moving-picture drama?"

"I feel that probably there pictorial photography has its greatest influence. We find very few serious film producers who do not study very carefully the construction of their pictures and the lighting of them, together with the proper motion-picture appeal—the appeal of the acting. They are really looking for all expressions of light and varieties of focus that the pictorial photographer has been interested in."

"It is said that D. O. Hill, the Scotch artist, who for a while practised photography with genuinely pictorial results, used paper negatives. Was his success due in any measure to this fact?"

"I don't think it handicapped him, and in many instances I feel that it contributed to the simplification of his portraits."

"Do you recommend the use of colour filters in pictorial work?"

"I do."

"Do you recommend fast or slow plates for pictorial work? What about films?"

"I would prefer to use, whenever possible, a slow plate. Films eventually, I believe, will be the only thing used, though not necessarily film packs or roll films."

"Do you mean that the glass plate will be discarded and cut

films be used? Is it not the fact that most practical photographers find a great advantage in using glass plates?"

"Of course, the advantage of the glass plate is that it is easier to handle; but a good thick celluloid film is almost as easy to handle, and these films are easily filed. They are not breakable and they are being made now in all the various emulsions. Their great advantage is in their lack of weight and their non-halation qualities. A great many photographers are burdened with plates and the filing and storing of them become a big problem."

"Have any improvements in cameras been made during the year?"

"As I see it, cameras have been improved in the direction of the needs of the pictorial photographer in that they have longer bellows extension and larger front-boards and are constructed for stability. As the photographer is working more and more in the open, this is necessary."

"What kind of a camera do you recommend for pictorial work?"

"Personally I feel that every photographer should first learn to photograph with a view camera. As his work develops he finds that it is a matter of getting his inspiration from incidents of life rather than building up his compositions in front of a view camera. Here is where the reflex camera is a great help."

"Then you recommend the reflex type of camera for serious pictorial work?"

"Yes, I do."

"Would you fit this type of camera with a soft-focus lens?"

"Yes, and also with an anastigmat."

"Have any new lenses been put on the market in 1918?"

"None that I know of."

"What do you think of the use of the soft-focus lens generally in pictorial work?"

"I think if pictorial photography were suddenly robbed of the soft focus lens it would be a catastrophe."

"Can the same results be secured with the anastigmatic lens by throwing it slightly out of focus?"

"No, for the results obtained with the soft-focus lens are due to its construction."

"What size camera do you recommend for pictorial work?"

"I think the tendency of the pictorial worker has been to use too large a view camera. It has been demonstrated that size does not determine the artistic value of a picture. I would recommend a camera that is not a burden to the person using it."

"Do you recommend workers to make enlargements from a small-sized negative for exhibition purposes? and, if so, what size enlargement do you prefer?"

"I should feel that the work above 11 x 14 is a mistake generally, and that a picture can be just as beautiful and in the long run more beautiful when it is kept within the dimensions of the 'whole plate' —6½ x 8½ ins."

"Do you recommend the working up of negatives for pictorial effect?"

"My preference is for photographs that have not been worked up, but if a man is successful in doing this to the extent of losing sight of the manipulation in the completed picture I see no reason why it should not be done, and I think it has been done with success by some good workers."

"Do you object generally, to manipulation or 'dodging' of prints or negatives as tending to produce hybrid results?"

"I feel that the practice of doctoring negatives is a bad one, but to achieve a result, if it is well done, it may be justifiable."

"What is the most approved fashion of mounting prints this year?"

"The most approved fashion is the one that was established many years ago in the presentation of etchings and engravings—a white or slightly toned mat, sometimes with a 'countersunk centre.'"

"Do you think that an ambitious amateur who desires to do good work can best improve his methods by studying exhibitions, or by studying books on art and composition?"

"I should say that the books on art and composition are of little value without the exhibitions, and that if worked together the book is made more valuable by the exhibition and the exhibition more valuable by the book, but the combination is absolutely necessary to achieve results. The tendency very often is that a continued study of books or exhibitions rather satisfies the worker, and he does not devote himself to his own problems of creative work."

"What is the greatest weakness in the work of the young photographer, and how can he best overcome it?"

"I think the greatest weakness of the young worker is the lack of something to express. He is too much interested in the photograph for the sake of the photograph alone—that is, in the medium or in the taking of the photograph itself. The photograph should express something."

"Just what do you mean, Mr. White, by 'expressing something'?"

"You get down to a very important point. The expression in a photograph may come from what we might call the design of the photograph or the distribution of light and dark to produce a visual sensation, just as a fine rug or piece of lace gives us a satisfaction in design, an expression in design. We can also introduce that into the making of a portrait, and embody not only a representation of the person's features, but create at the same time an interesting design or a better distribution of the parts of a portrait to make it convincing and definite."

"Do you mean that an amateur should go out into the fields with a preconceived idea of finding something to express, of making a pattern or doing something 'original'?"

"He should go out into the fields with an open eye and open mind to be moved to an expression of his appreciation of pattern, his appreciation of tone, of values, etc. Let him leave the mind open, and that will tell him what to express. He gets his inspiration from Nature, and he contributes to Nature just so much as he has of knowledge of photography, knowledge of composition, knowledge of tone values—he expresses himself that way. I do not believe he should go with a preconceived idea of what he is going to get. He should be moved by his subject. If he is not, he will become blind to the most beautiful aspects of Nature. That is the interesting thing of Nature; the changing light and shadow are never twice the same. The light is continually changing, and he has combinations and variations that a man with a preconceived idea will miss, and in photography that is the most impressive thing —that it can record those subtleties."

"Do you recommend workers to send only new photographs to the exhibitions? In other words, should a worker try to get new subjects continually, or send his older, and perhaps better, work in more limited amount?"

"It would be better to send his older work and keep the new photographs at home until he has studied them carefully."

"Do you regard photography as giving fair scope to the art impulse in people who have that impulse but are unable to devote their time to painting, etching, or other graphic art?"

"The question really expresses the idea that photography is supposed to be taken up when they cannot do the other thing, which I feel is a mistake. Photography is an expression, not necessarily as important or vital as the others, but it is an expression, and it can be used along with the others as well as alone."

"In other words, you feel that photography stands on its own merits?"

"I feel that it stands on its own merits absolutely."

"What, in your opinion, is the distinction between an amateur and a professional photographer?"

"I think the distinction between the amateur and professional photographer is difficult to draw. The greatest distinction that I can see is when the word amateur is applied so that it reveals the love of the amateur for his work rather than the sense of the duties involved in it. That is what the amateur gets out of the work; the professional's aim is too often what he can get out of it in the sale of his products."

"Can the pictorial photographer make a living in America under present conditions, or is the photographer who wishes to make a fair income to be recommended to confine himself to so-called 'commercial' or 'professional' work?"

"Being a pictorial photographer does not necessarily prevent his making a living. The pictorial photographer, if he is a good one, is naturally concerned more in producing a result than in marketing the result; and as a consequence sometimes he suffers. The pictorial photographer in reality ought to be a financial success, for the

tendency is strongly toward the development of the work in that direction."

"Will the ending of the war have a favourable effect on the future of pictorial photography and on the pictorial photographers of America?"

"I should say very decidedly yes. It will naturally liberate a great many repressed spirits, and that very liberation will express itself by bringing the worker in closer touch with nature, and the results will show this. I feel that the development after the war is going to be in the direction of art expression. As a specific instance, my own son, who was sick and tired of photography in general, has manifested a greater interest in it since he has been in the Army in France, through coming in contact with the old chateaux and the interesting art treasures that he has seen. He has developed a greater respect not only for art, but for photography; and this single instance has doubtless been repeated in thousands of cases on the part of our soldiers in France."

AMIDOL v. M.Q. FOR BROMIDES.

(From Rajar "Trade Notes.")

We have heard many discussions amongst professional photographers as to whether amidol or M.Q. is the most suitable for bromides, and there appears to be considerable divergence of opinion. Our papers are suitable to both, and, whilst many workers are producing perfect results with amidol, we are inclined to think that, from a commercial point of view, the M.Q. developer is to be preferred. The quality of blacks produced by either is equally good, and the tones in the sulphide or hypo alum baths differ very slightly.

With amidol, a great deal depends upon the skill and care of the worker in daily compounding the developer accurately, whereas the M.Q. can be made up in large quantities of constant strength and stored for convenient use—a point that will be appreciated by those who run more than one studio. The disadvantages of using amidol are, for brevity's sake, tabulated below, and in common fairness we will admit that most of these can be met by the careful personal attention of the skilled man.

1. Temptation to guess the proportions of amidol, sulphite, potass bromide, and water.

2. Bad keeping qualities of the mixed bath, and the daily risk of particles of dry amidol settling on drying prints or negatives.

3. Great susceptibility to the action of potass bromide; consequently when large batches are developed, the liberation of bromide from the paper introduces an element of uncertainty.

4. Rapid contamination of the fixing bath, unless the prints are washed after development, and risk of staining the gelatine or paper base.

5. Quick staining of the fingers and finger nails.

With M.Q., the making up of the developer can be a once-a-week job, by a principal if possible, making the solution double strength and storing it in 80-oz. (Winchester) bottles. There is no daily weighing out or measuring, as the developer only needs mixing with an equal part of water when required for use. The strength is constant, and the prints can be developed by time, a method that produces the most perfect results. The fixing-bath does not become quickly discoloured, nor do the finger-nails stain badly.

The formula for M.Q., recommended for use with our papers and bromides, is:—

M.Q. Developer—Double Strength.

Monomet	1 oz.
Hydroquinone	4 ozs.
Sulphite of soda (crystals)	2 lbs.
Carbonate of soda	2 lbs.
Potass bromide	1½ ozs.
Water (to make 8 Winchesters)	4 gallons.

Obtain a three-gallon jar three-quarters full of hot water, add the monomet first, stirring until dissolved, then add the hydroquinone, sulphite, and bromide, stirring until all is dissolved. Add the carbonate last. Have eight clean Winchesters at hand, and with a measure or bottle fill them to equal height with developer. Then add water to fill the bottles and stopper them.

SHOWING LARGE PROOFS.

(A Note in "Camera Craft.")

There is a certain professional that I call upon who has worked out, with the aid of his receptionist, a plan that seems to give the most gratifying results. When the customer first calls the latter makes no special effort to sell large sizes, further than to show them and quote prices only, as a matter of showing what is available; in fact, if there seems to be any doubt in the customer's mind the receptionist kindly advises that a small or medium size be considered, because it is quite easy to make enlargements from the small negatives if a larger size be ultimately decided upon. The customer takes very kindly to this somewhat radical change from the overdone urge of large sizes and high-priced work, and the frame of mind so established is a much more desirable one and one more conducive to future good business than the antagonistic one created by even the slightest suspicion of what too often passes as "good salesmanship." The sittings are made, but here is where the plot deepens: instead of making the small negatives, the operator exposes the 6½ by 8½ plate the studio uses for all its work. When the proofs are shown all have been made the small size by using the enlarging and reducing camera, while the one or two best ones that the photographer desires orders from are made full size. Any receptionist or proprietor of any experience can readily see how much easier it is at this time to let the customer order the large size, and from the desired negative, particularly if the pictures meet with his approval, than it is to try and force an order for large sizes before the pictures have been made. The imaginary "enlargements" are of unexpected good quality; they suggest that even still further enlargements will be pleasing, and that makes it easier than would otherwise be the case to get an order for an extra size enlargement or two. Of course, there is an element of deception introduced, but it is one that benefits the customer, even if the smaller size is really all that is wanted, for the reason that the reductions from the large negatives are as good, if not better, than would be the same size of contact prints, and the contact prints from the large negatives are better than enlargements would be, and, of course, just as good as if ordered in the large size at first. All the deception really does is to give the customer an opportunity of changing his original order for small work to larger without suffering the penalty of not having so decided at first. It, of course, involves a greater plate expense on the part of the photographer, but, as our professional friend advises, the extra cost is well worth the better feeling engendered, to say nothing of the larger orders the plan seems to automatically produce.—The Demonstrator.

Exhibitions.

COLOURED PRINTS AT HAMPSHIRE HOUSE.

A most interesting series of coloured prints by Mr. and Mrs. W. Giles is now to be seen at Hampshire House Photographic Society, Hog Lane, Hammersmith, W. There are about thirty pictures shown, and they are throughout sketches, drawing, cutting the blocks, pigmentation and hand printing, the work of the artists' own hands. They owe their conception to the influence of the work of the artist craftsmen of Japan, but they are largely individualistic also.

Printing in colours from wood or metal blocks has its limitations, and the very narrowing of the field, as in Japan, had the effect of so focussing the artists' efforts as to produce results that within their own sphere are truly excellent.

In ancient Egypt the keynote of their sculptural monuments was a crystallisation of characteristics, and an elimination of details and non-essentials of form. This came about through two principal causes. The ideographic character of their writings, which persisting through thousands of years forced and fostered the endeavours of the scribes to attain simplicity; and the second cause was the refractory nature of the materials—granite and porphyry—they used. Precisely the same causes operating in Japan produced similar results. The Japanese learned to portray the utmost likeness and liveliness of the subject in the fewest possible number of strokes and colours.

Mr. and Mrs. Giles' works show the same feeling, but they also

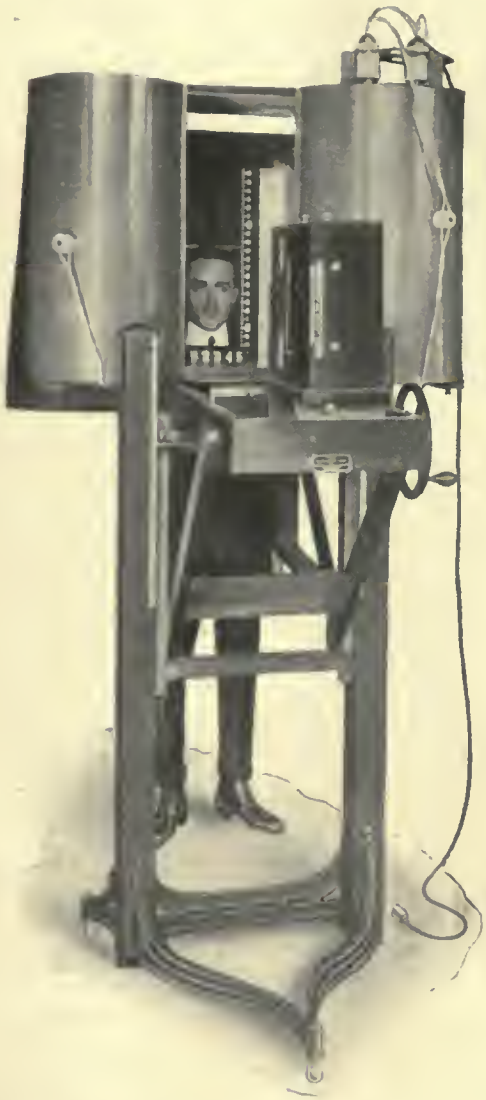
have a more varied palette, and a more transparent and brilliant pigmentation. The exigencies of space preclude us from detailed descriptions. There is a lure about the works of these two stylists that is very attractive. One lingers and loiters in front of the pictures absorbing and observing, the eyes are gladdened and the soul is satisfied.

The Exhibition remains open (free) until March 6, every day from 10 a.m. until 1 p.m., and from 2 p.m. until about 7 p.m., on Thursday the whole evening also.

New Apparatus, &c.

The F. and S. Identification Outfit. Made by Kodak, Limited Kingsway, London, W.C.2.

We were recently interested in examining in practical use a piece of apparatus of which very wide use has already been made in the United States in connection with the prosecution of the war. Briefly, the apparatus consists of a self-contained camera and arti



ficial light, serving to produce in rapid succession upon a band of film small portrait negatives under absolutely uniform condition. The negatives measure about 1½ by 1¼ inches, and include on each one a record of the height of the person photographed, together with a registration number. The illuminating system is composed of a battery of half-watt lamps placed behind diffusing screens, and affording an extremely even, but powerful, illumination. Thus, exposure is made by shutter in a fraction of a second, and the whole operation of taking the portrait need occupy barely more than a minute, inasmuch as the subject has simply to stand behind a framework attached to a horizontal platform, which also carries a camera. The height of this platform has simply to be adjusted to bring the subject's face centrally within the space of the frame in order for the exposure to be made. The sensitive film is wound from one spool box to another, as in a cinematograph camera, and may be bought in lengths for 150, 250, or 500 exposures.

The applications for such an apparatus as this are obviously very wide when it is considered that the instrument takes up floor space of only about 8 by 4 feet, and can be used wherever there is an electric circuit available. The making of portraits of season-ticket holders for attaching to the ticket is a question which has been discussed now and again. The F. and S. identification outfit would permit of the scheme being easily carried out in any railway office. Inasmuch as one may foresee a stricter regulation of the individual in this country, it can be well imagined that a portrait will form part of other licence documents, such as those used for driving a motor-car, shooting, admission to libraries, and the like. And it is certainly to be expected that any scheme of registration of aliens will embody such a feature, and will thus render it more efficient in controlling the movements of suspect persons.

The apparatus is made with the excellence of workmanship and regard to utility which characterise the manufactures of the Kodak Company, and is priced at £85, subject to a considerable discount.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

MONDAY, FEBRUARY 17.

Bradford Photographic Society. "Colour Photography." J. W. Dawson.
Dewsbury Photographic Society. "Intensification and Reduction." W. E. Gondill.
South London Photographic Society. "Portraiture." W. Foster Brigham.

TUESDAY, FEBRUARY 18.

Royal Photographic Society. "A New Process of Printing on Paper in Natural Colours." S. H. Williams.
North Wilts Field and Camera Club. Demonstration: "Bromide Printing." S. S. Hallett.
Hackney Photographic Society. "The Domestic Fly." Dr. G. H. Rodman.
Chelsea Photographic Society. Dark Room.
Manchester Amateur Photographic Society. Monthly Exhibition arranged by A. W. Burgess.
Birmingham Photographic Art Club. Copying by Artificial Light." W. F. Carter.

WEDNESDAY, FEBRUARY 19.

Croydon Camera Club. An Evening with T. H. B. Scott, accompanied by some of his pictures.
Dennistoun Amateur Photographic Association. "Pictorial Work" (Illustrated). R. Park.

THURSDAY, FEBRUARY 20.

Liverpool Amateur Photographic Association. "From Alp to Apennine." J. D. Johnston.
Brighouse Photographic Society. "Walks in Lakeland." S. Greenwood.
Huddersfield Naturalist and Photographic Society. "Liquid Air." Dr. J. Bruce, B.Sc., F.I.C.
Hammersmith (Hampshire House) Photographic Society. "Enlarged Negatives." R. K. Lawton.
Hull Photographic Society. Y.P.U. Slides. Secretary.
Rodlay and District Photographic Society. Monthly Competition: "Firelight."
Wimbledon Camera Club. "Romance of London." C. M. Forbes. Monthly Print Competition.
Tunbridge Wells Amateur Photographic Association. "Mounting the Print." G. C. Weston.

ROYAL PHOTOGRAPHIC SOCIETY.

The annual general meeting was held on Tuesday evening last, February 11, the President, Dr. C. Atkin Swan, in the chair.

The report of the Council was taken as read and immediately by some perverse motive read paragraph by paragraph. The society has fifty more members than a year ago, its real membership being 971. In financial affairs it has just paid its way with the aid of a surplus from the special exhibition fund raised in 1917 by its then president, Mr. John H. Gear. On the proposition of the President, seconded by Dr. Rodman, the report was adopted.

The Treasurer, Mr. A. H. Lisett, in making his comments upon the statement of accounts followed his accustomed course of

computing the cost of per member of such items in the expenditure as lighting, the JOURNAL, and salaries. The adoption of the balance-sheet was seconded by Mr. W. B. Ferguson and carried.

On the proposition of Mr. E. Smith, seconded by Mr. G. Hawkings, a vote of thanks to the President, council and officers was passed by acclamation.

The report of the scrutineers of the ballot was then read showing that voting papers to the number of 172 were sent in, and the following were the officers elected for the present year:—

President:—Dr. C. Atkin Swan, M.B.

Vice Presidents:—F. F. Renwick and Dr. G. H. Rodman.

Honorary Treasurer:—A. Herbert Lisett.

Ordinary Members of the Council.—

F. C. Boyes,	F. Martin Duncan,
A. J. Bull,	E. W. Mellor,
Captain D. Cameron Swan,	Lt.-Col. J. T. C. Moore-Brabazon
C. Bellamy Clifton,	Chas. F. Oakden,
H. Essenhigh Corke,	E. Sanger-Shepherd,
W. B. Ferguson, K.C.,	W. F. Slater,
Captain F. H. Grenfell,	W. L. F. Wastell,
J. Dudley Johnston,	J. C. Warburg,
Ernest Marriage,	S. H. Wratten.

The only other business of interest which followed was some discussion of the Society's attitude towards unnaturalised members and fellows of enemy nationality, whose names have been removed from the Society's lists. It was understood that it is the Council's firm determination not to restore them.

CROYDON CAMERA CLUB

MR. F. R. D. ONSLOW gave a lantern lecture on "Some British Birds and their Homes," being a repetition of that recently delivered at the Royal Colonial Institute, which led to some controversy in the Press. A most interesting subject was handled in a thoroughly happy manner, and the slides illustrated first-rate craftsmanship in every particular. Really wonderful considering the difficulty of the work.

Particularly ingenious were the methods by which shy birds were photographed in their habitat. Sometimes the lecturer camouflaged himself and camera as a rubbish heap. On the borders of Scotland a sham and hollow "scratching post" (God Bless the Duke of Argyll!) was used to contain the camera, operated from a distance by electrical or other release.

But the finest touch was when, with the assistance of a wig maker for the head, he assumed the guise of a sheep, a plan which was found most effective for stalking the game. Naturally, as he had to crawl on all fours, and over stony or marshy ground, he must needs be a bit of an enthusiast. The rig-up was first tried on a real sheep—one, by the way, possessed of formidable horns. It watched the gradual approach of the new breed with evident disfavour, but with no apparent suspicion, but when close quarters were reached it suddenly resolved to give the mysterious stranger a sharp lesson, and went for him all out. In self-defence Mr. Onslow immediately shot up to an erect position, and that sheep experienced the shock of a lifetime and bolted for all it was worth. Judging from a slide shown, even a highly intelligent sheep would be deceived, so natural was the presentment. Certainly, the expression seemed a trifle rigid; but then sheep are hardly famed for mobile countenances.

It was noticed that during the evening the Secretary, Mr. Sellors, at irregular intervals, and without apparent cause, chortled in joyful manner, and a question elicited the reason for this eccentricity. Both he and the lecturer employ exclusively "ordinary" brands of plates, and it happened that many slides included white birds against a blue sky, and rendered the feathers in beautifully graduated light tones against a grey background. Hence the Siberian delight.

Probably most readers at some time or another in their lives have studied the pretty little birds which congregate on the esplanade or pier at the seaside, but these are a particular species, though the plumage widely varies, and a word of caution may not be out of place against climbing a tree to inspect the nest of a heron. The young birds have an objectional habit of being violently sick when disturbed, and in one case mentioned by Mr. Onslow a disgorged mixture of decomposed worms and fish unexpectedly applied as an eye ointment to the climber nearly resulted in a nasty accident. A most hearty vote of thanks was accorded for an altogether excellent lecture.

HEREFORDSHIRE PHOTOGRAPHIC SOCIETY.—The general meeting of the Herefordshire Photographic Society was held at the Society's Rooms, 76, Eign Street, Hereford, on February 4. Mr. Ernest G. Davies presided, and there were also present Miss McAdam, Mr. A. C. Slatter, Mr. A. Naylor, Mr. W. Williams, Mr. W. A. Grosvenor, Mr. Gransmore, Mr. Brumbill, and Mr. A. Lovesey (hon. secretary and treasurer). It was stated that there were about fifty members, and the accounts showed that the society was in a sound financial position, a deficit of over £6 last year having been practically wiped out. Mr. Alfred Watkins was unanimously re-elected president, and thanked for his past valuable services; and the vice-presidents were Mr. John Parker, Mr. W. J. Humfrys, Mr. J. S. Arkwright, Mr. W. C. Gethen, Mr. E. G. Davies, Mr. S. Beeson, Dr. Hermitage Day, and Mrs. G. Leigh Spencer, while it was also proposed to add the name of Mr. C. T. Pulley, M.P. Mr. A. Lovesey was also unanimously re-appointed hon. secretary and treasurer, with Mr. W. Davies as hon. librarian, Mr. S. Beeson hon. lanternist, and Mr. A. C. Slatter hon. auditor. On the council were elected Mr. W. W. Robinson, Mr. W. Williams, Mr. W. Davies, Mr. E. G. Davies, Mr. W. A. Grosvenor, Mr. A. Naylor, Mr. S. Beeson, Mr. J. Porter, Mr. A. G. Turner, Mr. J. H. Stooke, Mr. W. Marchant, Miss McAdam, and Mr. Devonport.—It was stated that two winter evenings and three summer outings would, if possible, be arranged, and now that the war restrictions had been removed from photography it was hoped that the members would display an increased enthusiasm, and that a brighter season was in front of the society.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.—At the last meeting, the chairman, Mr. F. Creighton Beckett, entertained his fellow members with his lecture "The Experiences of a War Photographer." He described his endeavour to obtain a position in the Flying Corps and how he ultimately went to the front as an official photographer. His description of the war, in conjunction with some 200 slides, revealed many phases which were entirely new to most present. His photographic equipment was truly a formidable one, a six-foot step-ladder stand, a full view Eastman stereoscopic camera, plus two cases containing thirty-six 8 by 5 double slides. Work behind the lines was fairly easy, but to go over the top and take photographs of advancing troops required some nerve. Incidentally field hospitals in full operation were shown, also a quaint horse hospital inside a disused sugar boiler. The lecturer's slides of Hun shells bursting in mid-air were decidedly interesting, as was also his description of plate changing in dug-outs. Mr. Beckett has made journeys in tanks, balloons, aeroplanes, and on foot. He showed slides taken from varying altitudes, and also of U-boats. The War at home proved equally interesting: his slides included "Baby Killers," and records of air-raided and bombarded districts. Mr. Beckett seemed to have photographed nearly everything from U-boats to field kitchens, the King, General Staff, down to Tommy home on leave.

NEW PHOTOGRAPHS OF THE TROOPS.—The Committee of the Imperial War Museum has taken over the control of the official photographers in various theatres of war. These photographers are of three descriptions, namely:—(1) Operators who, for a long time past, have taken the official photographs which have appeared in the daily Press. (2) Newly appointed photographers who will take portrait groups of the troops in France. One of these operators will be allotted to each Army. (3) Newly appointed operators to take photographs for the Records purposes of the Imperial War Museum. There will be about seventy of these operators employed in France, and arrangements are also being made for the appointment of operators in North Russia. Prints of the photographs taken under (1) can be inspected and copies bought at the Imperial War Museum, Photographic Section, 10, Coventry Street, London, W.1. Prints of the photographs taken under (2) and (3) will be obtainable in the same manner as time and circumstances permit. Arrangements are being made for the purchase of photographs taken under (2) by soldiers in France. They will be obtainable at a low cost. The Imperial War Museum has five photographic exhibitions running in the country.

Correspondence.

**** Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

**** We do not undertake responsibility for the opinions expressed by our correspondents.*

DEVELOPER POISONING.

To the Editors.

Gentlemen,—I understand an article appeared some time ago with reference to skin poisoning by metol or amidol. I did not see the article, but I understand the writer said there was no known cure for the complaint. Will you permit me to give my experience on this subject? I have been a victim of metol and amidol skin poisoning for over 18 years all over the fingers and arms. I have attended doctors both in England and Scotland, but with little benefit. I saw Ujah ointment advertised in the "Journal," and tried it. What surprises me now is that the doctors did not discover this ointment before this, because to me it has been a miracle, and I would ask every man and woman suffering from this dread complaint to write to the Ujah Ointment Company, and I take upon myself to say that if they fulfill their conditions in the using of it, it will prove a miracle to them as it has been to me.—I am, yours,

OPERATOR.

WASHING PRINTS.

To the Editors.

Gentlemen,—I notice a reference in this week's "Journal" to washing prints. If photographers would only do as I do they would have no further trouble. I have an ordinary photographic sink with plug. The only extra expense is for one clothes-peg, American pattern, best without metal top, and one ordinary cheap clamp with screw. Put the thin end of the clamp into the clothes-peg, just fix it in, then put the clamp and peg on to the edge of the sink, clothes-peg side inside the sink—most photographers have a piece of tubing to the tap—then put the free end of the tube into the bottom of the clothes-peg, turn on the tap, and you have a good whirl of water all round the sink. To empty the sink, put an ordinary 2-lb. jam jar over the plug with a small piece of wood to keep it off the ground, and when the sink is full it will act as a syphon and will fill and empty itself until further orders. It will do for postcards or large prints. I test all mine with permanganate, and if it is occasionally looked at to see that the tap is running at the right force to fill and empty itself it is the best I have ever used. —Yours truly,

A. ENGLAND.

50, High Street, Barnet.

THE MERCURY VAPOUR LIGHT

To the Editors.

Gentlemen,—Referring to the article on "Artificial Lighting" in this week's "British Journal," may I be allowed to point out a correction concerning the use of mercury-vapour lamps? The statement that the ghastly appearance which this light unfortunately has "may be overcome by hanging a thin pink curtain in front of the tubes" is misleading. Mercury vapour giving a minus-red light, hanging up a thin pink curtain will have no more effect than hanging up a dirty duster, for both would have much the same appearance, it not being possible to see red by this light. There is one exception, however, in the case of rhodamine, which is a scarlet dye. Reflectors coated with a varnish containing this dye have the mysterious property of supplying the missing red, so that a more or less white light results. Cardboard so coated used to be obtainable at a cost of something like 7s. per square foot.—Yours,

STANLEY BEAUFORT.

Elliott and Fry, Ltd., 55, Baker Street, February 8.

["Practicus" writes that he is quite aware of the theoretical uselessness of the pink curtain, but that, as it happens to answer the purpose, he advocates it. It was first suggested by Mr. A. Langfier about twelve years ago, and since then has been successfully used in many studios. Pink nun's-veiling was the material used.—Eds. "B.J."]

BRITISH AND GERMAN LENSES.

To the Editors.

Gentlemen,—I have read with great interest your editorial article with reference to "German and British Lenses" in your issue of the 3rd inst. You have touched very forcibly upon a very important point. There is a legend in the minds of at least nine out of every ten users of cameras in this country that German are superior to British lenses. It has often in the past taken a very strong light of scientific truth to break through the gloom of superstition. This false doctrine of German superiority must be dispelled, so let us have the necessary light in form of statements of fact such as some of those appearing in your article. Why cannot the facts regarding the merits of British lenses be gathered together and published in a popular way in the lay press? The technical press is read by too few of the public. Very few camera users ever read a photographic journal. I urge you not to permit the question to drop, but to keep it in the forefront until this objectionable legend is utterly dissipated. May I suggest that much of the advertising matter of British makers could be improved? It so often seems flat, and lacks force. Why not make it more real? Is any progress being made? Then tell us in a few words wherein it consists. This country longs to do business in fine goods with Great Britain. Can it not be shown that the goods are superior to any other? Let us have information.—Sincerely yours,

GEORGE C. CAMPBELL.

Toronto, Canada.

"CINEMATOGRAPH" OR "KINEMATOGRAPH."

To the Editors.

Gentlemen,—It is gratifying to note that the "B.J.," with its usual keen sense of the fitness of things, has never been misled into spelling the words "cinematograph" and "cinematography" with a "k."

The first use of the word cinematograph was by our French allies (M. Bouly, in 1892, and M. Lumière, in 1895), and these, of course, spelt it with the much pleasanter-looking and more English "c." It was, in fact, the "kultured" Teuton who began to write motion pictures with a "k."

Some etymological purists may object that the word cinematograph comes from two Greek derivations—*kinema*, motion, and *grapho*, to write. Well, what of that? There are many other English words, also formed from Greek roots and beginning with or containing "k," which no educated person ever dreams of spelling save with a "c." How ridiculous, for instance, the following sentences look, in which a few such words have been spelt in strict agreement with their origin! "The deakon suffers from kolic, due to watching komets and eklipses in the teleskope on the Oktagon. He has been ordered to a warmer klimate, to go in for kykling and akrobatics; but, above all, to keep out of the krypt and the katakombs, or, as a klimax, he may fall into a kataleptic state and need more kaustik treatment." Yet, either the foregoing "howlers," suggestive of a third-standard examination in a council school or of so-called "reformed" spelling, are entirely correct, or else "kinematograph" must be wrong. One cannot have it both ways.

No reflection whatever is intended on any person, periodical or text-book, that has hitherto, perhaps thoughtlessly, used the "k" instead of the "c." But surely, in the light of some recent happenings, there is little excuse left for preferring an essentially Germanic orthography to one supported by the best British, French, and Latin precedents.—Yours faithfully,

A. LOCKETT.

THE ASSISTANT QUESTION.

To the Editors.

Gentlemen,—Judging by the correspondence which has appeared in your columns under the head of "The Assistant Question," there seems to be a general consensus of opinion that better provision should be made for the training of photographic assistants, although there is naturally considerable difference of opinion as to the best means of attaining this end.

It appears to me that the proper body to undertake this work is undoubtedly the P.P.A., but, as far as I am able to judge from the reports of its proceedings, the council of that association, although

it has admittedly done, and is doing, excellent work, is not fully alive to its duties and opportunities in that direction. I, for one, should like to see the Association provide or assist in providing, proper training facilities in various branches of photographic work, in London and other large centres.

I should like to see examinations held periodically in London or elsewhere if required, and certificates of efficiency granted to successful candidates.

This, and other possible extensions of the work of the Association, would probably involve the employment of a full-time secretary and the provision of a central office; supplemented, if thought advisable, by voluntary district secretaries in various parts of the country.

The Association might, in my opinion, be very much strengthened and its constitution be more in accordance with modern democratic principles, if it were opened, under certain conditions, to assistants as well as employers.

It might be advisable to confine the membership, as far as new members are concerned, to those who have obtained a certificate of efficiency under the above suggested examination scheme. The new condition of admission to membership not coming into force for twelve months, in order to afford the established photographers who had not hitherto joined the Association, but who might feel disposed to do so in view of future developments, an opportunity of becoming members without examination.

A possible extension of the scheme might be the annual election, either by the Council or by the whole of the members, of Fellows of the Association, in consideration of exceptionally high standard of work, or of services rendered to the photographic profession.

It would be obviously impossible to carry out such a scheme on the present totally inadequate subscription, which it would probably be necessary to raise to at least £1 1s. to employers and, say, 10s. 6d. in the case of assistants.

Hoping that these quite tentative suggestions will give rise to a useful correspondence on the subject.—Yours faithfully,

G. E. Houghton.

55, Fort Road, Margate.

FORTHCOMING EXHIBITIONS.

February 10 to 22.—Glasgow and West of Scotland Amateur Photographic Association Inter-Club Exhibition. Secretary, Gilbert S. McVean, 125, West Regent Street, Glasgow.

February 20 to 22.—Leicester and Leicestershire Photographic Society. Secretary, H. C. Cross, 80, Harrow Road, Leicester.

February 22 to March 8.—Edinburgh Photographic Society. Entries close February 13. Secretary, George Massie, 10, Hart Street, Edinburgh.

April 17 to May 22.—Hammersmith Hampshire House Photographic Society Annual Exhibition. Two open classes. Entries close March 13. Joint secretaries, J. G. Abrahams, 41, Hamilton Terrace, London, N.W.8; A. H. Page, 12, Lime Grove, London, W.12.

Snowden Ward Memorial Fund.—Mr. J. C. Warburg informs us that he has received a report of the fund from Mr. Morris, House Governor of the London Hospital. So far, no calls have been made upon the fund, the balance of which available for distribution now stands at £60 1s. 2d., made up as follows:—1913 to 1917, income as account rendered, £52 19s.; 1918, dividends received, £5 6s. 2d.; income-tax recovered, £1 16s. Total, £60 1s. 2d. Mr. Morris does not anticipate that this will be the case indefinitely; meanwhile, the fund increases gradually, in readiness for future contingencies. The capital remains in £180 Central London Railway stock at cost, £153. Mr. Warburg calls the attention of photographic and philanthropic societies to this fund, which is available to help any needy photographer who is an in or out-patient of the London Hospital, for purposes to which the ordinary income of the hospital is not applicable. The almoners of the hospital may, for instance, apply it towards rent, or strengthening food, or a stay at the seaside after treatment at the hospital itself, or for other beneficial purposes, within their discretion. The word "photographer" above includes a wide number of cases.

Answers to Correspondents.

SPECIAL NOTICE.

In consequence of general reduced supplies of paper, as the result of prohibition of the importation of much wood pulp and grass, a smaller space will be available until further notice for replies to correspondents.

Moreover, we will answer by post if stamped and addressed envelope is enclosed for reply: 5-cent. International Coupon, from readers abroad.

The full questions and answers will be printed only in the case of inquiries of general interest.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

A. P.—Messrs. Griffiths Steam Works, 26-31, Eyre Street Hill, Hatton Garden, E.C.

N. E.—There are only two outfits made—the "Powerful" of Messrs. Kodak, Limited, Kingsway, W.C., and the "Howellite" of Messrs. John J. Griffin and Sons, Limited, Kingsway.

E. W.—We should distrust the pyro for development, but would recommend you to make up 20 ozs. according to your usual formula. If it develops satisfactorily there will be no harm in using it.

T. N.—1. If there are no rights of reproduction an average price for ½-plate prints would be, say, 2s. 6d. each. 2. For the right to reproduce the photograph once only in a book or periodical, the charge would be 10s. 6d. per photograph.

H. E.—The Koresko is what is termed a daylight enlarger, and can be used with any ordinary lens. The cost price for the 15 × 12 size was about £3 3s., including lens. Its present value would be about 35s.

G. D.—There is no published formulæ so far as we know for hydroquinone in combination with Rodinal. Generally speaking, Rodinal is added to hydroquinone at the time of use in quantity sufficient to give the more rapid development of detail which is the characteristic of Rodinal.

W. J.—The maximum aperture would be f/3, provided that the supplementary lens is at least equal in diameter to the original front lens. The addition of the supplementary lens would interfere with the definition to a considerable extent, and it would probably want stopping down to f/16 to be usable.

C. J.—The specimen print has the look of a red chalk image which has somewhat faded. The usual method of getting such results (they need not necessarily be fugitive) is by first sulphide-toning in the usual way with the ferri-cyanide bleach, followed by soda sulphide, and then toning for a shorter or longer time in an ordinary gold-sulphocyanide bath as used for P.O.P.

G. E.—1. Little to choose between the two patterns. We should say the single metal slide (as it was obtainable before the war) is a better-made article than the wooden slides. Of course, if your slide is not a tight fit, you are bound to get fog. 2. Yes, a very good lens. 4. If you are using the camera for all kinds of purposes, for instance, copying, a double extension pattern will be much the best.

W. B.—The usual plan is to set up the titles in type, or to draw them in ink on a large scale and to photograph down to the required size. If they are required white on black, the negative is then cut into strips while on the glass, and the strips

transferred to the landscape negative by the usual method with hydrofluoric acid. Or you might print a positive transparency which will give you black letters on a white ground.

J. H.—The distance between light and condenser is variable according to the degree of enlargement, about the diameter of the condenser is an average distance. The negative should be put as near to the condenser as possible, 8¼ inches will then only barely cover the half-plate. You can use a 50 c.p. globe, but it is rather too large in area. Try to get one of the smaller half-watts.

T. C.—A good furniture polish such as Adams's will answer for the woodwork unless it needs a varnish, in which case you would have to use French polish. There is a varnish called liquid veneer which puts on a good gloss. For the leather, a little olive oil will freshen it up if not in bad condition. If the surface is gone, you should use one of the ready-made revivers such as Nugane, which is made in various colours.

H. W.—The only advantage of an electric dry-mounter is that it is free from the fumes of burning gas, and that it does not call for the attention as regards ventilation that a gas-heated dry-mounter does. It is more costly in use than gas at ordinary rates of electric supply, and the resistances are liable to wear out, whilst connections may also go wrong. We do not think there is much difference in the speed of heating up, and are unable to give you any reliable figures for second-hand prices of these goods. There is no doubt the gas model is much the better.

G. B.—We think the best reproduction process for your landscape photographs would be machine photogravure. You should write to Messrs. Vandyck Printers, Limited, Park Row, Bristol, for quotations for work of the kind which has figured as frontispieces to the "B.J. Almanac" for the last two or three years. Next to this is collotype, two firms doing which are Messrs. Waterlow and Sons, Broken Wharf, London, E.C., and the Photophane Company, Cranfield Works, Brockley, S.E.4. The specimen you send is ordinary half-tone, one of the best firms for which is Messrs. Hood, Limited, St. Bride Works, Middlesbrough.

W. B.—The only formula we know of for a combined developing and fixing solution for ferrotype plates is the following, published some years ago by a German maker of these plates :—

Soda sulphite, cryst.	31 parts.
Hypo	248 ,,
Soda carbonate, cryst.	8 ,,
Potass bromide	8 ,,
Water	800 ,,
Hydroquinone	20 ,,
Ammonia (sp. gr. .91)	45 ,,

Petzval Lens.—I have the component lenses for several Petzval lenses (three different foci sets), which I want to mount up for my own use. I do not know, and cannot seem to find in my books the formulæ to determine the separation and position for stop. Could you kindly furnish this?—A. H. B.

The amount of separation in such lenses is not a definite quantity, but is the result of a compromise between astigmatism and roundness of field, the former being in excess on a long tube and the latter on a short one. This you must settle by trial, starting with the average length for the sizes of lens you have. The stops may be placed midway between the combinations.

Bleach for Bromides.—I notice a formula in your 1918 Almanac for outlining drawings from bromide prints, etc., which consists of the following :—

Thiocarbamide	240 grs.
Nitric acid	4 drs. (fl.)
Water	20 ozs.

My dealers inform me that thiocarbamide, being a German product, is now unobtainable, and they know of no suitable substitute. Can you kindly tell me if there is any other process by which to produce the same result?—H. K.

The silver image of a bromide print should be bleached entirely away, leaving the inked drawing, by means of a mixture of iodine and cyanide. Make a 10 per cent. solution of iodine (in potassium iodide) and potass cyanide, adding about half a drachm of each to 1 oz. of water, and if the solution does not bleach as energetically as it should, add more of the cyanide.

O. A. W.—1. (a) The bisulphite solution is sold by Lumiere. The instructions refer to that, though the solution as sold by other makers, such as Johnson's, probably does not differ materially from that. We do not know what is the relation of the solid bisulphite to the solution. (b) We cannot understand your query. (c) No objection that we can see to masking down Autochrome pictures. (d) Dissolve in distilled water and keep in the dark. 2. The usual practice is certainly to mount on canvas and to mount the canvas on a stretcher. We should not think that canvas between print and mount would give a canvas effect. 3. None that we know of. 4. Water-colours are certainly easier, and for a certain class of work—light effects—more popular, though we should say that a great many more enlargements are sold coloured in oils than in water-colours. 5. The more transparent brown image renders the print considerably more amenable to colouring. 6. The only alternative is the special filter sold by Zeiss and possibly obtainable from second-hand dealers. It obviates reversal of the focussing screen.

Mr. J. R. Crisp, late manager to Messrs. Sichel and Samuelson, having recovered from wounds received on active service in France, is now rejoining the firm in the capacity of representative for the Midlands and North of England in place of Mr. Extine, now no longer associated with the firm.

Society of Master Photographers (Lancashire and District).—The first dinner in connection with the Society will be held at the Albion Hotel, Piccadilly, Manchester, on Tuesday, February 25, at 5.45 p.m. An excellent musical programme has been arranged for 7 o'clock to 9.30 p.m., thus enabling members to reach home in good time. A satisfactory response has been received, but a few more tickets are available, and may be had by making early application (the accommodation is limited) to the Hon. Sec., F. Read, 14, Balfour Road, Southport. A general meeting of the Society will be held at 4.30 p.m. on the same day, February 25, at the Albion Hotel, Manchester.

The British Journal of Photography.

IMPORTANT NOTICE.—Advertisers are requested to notice that the prices printed below represent an

Increased Scale of Charges,

which is now in operation in respect to all line announcements.

Since advertisements cannot be inserted until fully and correctly prepaid, senders of line announcements are asked to bear in mind this revised tariff. They will thus save themselves delay in the publication of their announcements.

Net Prepaid Line Advertisements.
Increased Tariff of Charges.

12 words or less	1/-
Extra words	1d. per word.

(No reduction for a series.)

Special Note. Adv'ts under a Box Number.

"Box No." and office address	charged as 6 words.
For forwarding replies add	6d. per insertion for each adv't.

If replies are called for this latter charge is not made.

Advertisements cannot be inserted until fully and correctly prepaid.

Orders to repeat an adv't must be accompanied by the advertisement as previously printed.

Advertisements are not accepted over the telephone.

The latest time for receiving small line advertisements is 12 o'clock (noon) on Wednesdays for the current week's issue.

Displayed Adv'ts should reach the Publishers Monday morning.

The insertion of an Advertisement in any definite issue cannot be guaranteed.

HENRY GREENWOOD & CO., Ltd., Publishers, 24, Wellington Street, Strand, LONDON, W.C.2.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3068. Vol. LXVI. FRIDAY, FEBRUARY 21, 1919. Price Twopence.

81

Contents.

	Page
Ex Cathedra	81
The Education of Assistants	82
Practicus in the Studio. By Practicus	83
The Future of Aeroplane Photography. By Arthur Brewer, Jun., and L. J. R. Hunt	84
Assistants' Notes	87
Patent News	88
Meetings of Societies	88
Correspondence—	
Kinematograph—The Mercury-Vapour Light—Shorter Hours in the Dark Room — The Hydroquinone-Rodinal Developer — The Assistant Question	90
Answers to Correspondents	92
Forthcoming Exhibitions	92

SUMMARY.

In this week's article "Practicus" deals with accessories and furniture. He believes that the day is not distant when portraits will again be relieved by the judicious use of these appliances. (P. 83.)

At the last meeting of the Royal Photographic Society Mr. S. R. Williams described a method of making colour prints on paper. He makes a negative on the well-known Joly system, and by means of a special masking plate cuts out two of the three elemental colour lines; from the remaining one he makes a bromoil transfer, which is transferred to drawing paper. The other two colour-sensations are treated in like manner. (P. 88.)

A long article on photographic surveying from the aeroplane is reprinted from the American journal "Aviation." The writer believes that in the future aerial photographs will be largely used for filling in the details of survey work, and sets forth the essentials of a camera suited to the purpose. (P. 84.)

The Edinburgh Society of Professional Photographers, at their last meeting discussed their education of assistants project, as well as the fixing of a minimum price for postcards. (P. 89.)

The question of the education of assistants is discussed in a leading article, in which we point out the necessity of training being started immediately the prospective photographer leaves school. (P. 82.)

Many people imagine that when a patent has been granted to them they are secure against infringements. This is not the case, as the official search for anticipations only extends to previous specifications. This point is dealt with on page 82.

A claim for the spelling of cinematograph with an initial "K," screening the mercury-vapour light, a maximum day for dark-room workers, and the hydroquinone-rodinal developer, together with letters upon the assistant question, fill our correspondence columns. (P. 91.)

The amateur lecturer who wishes to discourse on photographic technics and history is often at a loss to obtain his material. We indicate a few sources of information on page 81.

Studio construction, enlarging without condensers, lens matters, and stains for picture frames, are among the subjects touched upon in "Answers to Correspondents." (P. 92.)

We point out the unreasonableness of some of our correspondents who write to us complaining of the quality of prints and enlargements advertised at very low prices, expecting to receive work of equal merit with that of first-class firms. (P. 81.)

A very practical lecture on toning bromides was given by Mr. H. S. Newcome at the Croydon Camera Club. Many interesting points were raised at the subsequent discussion; a formula for red black toning, which differs somewhat from that generally used, was given. (P. 89.)

EX-CATHEDRA.

Low-Priced Trade Work. In a business such as photography, in which the goods sold to the public exhibit so wide a range of quality, it is, of course, natural to find a similar range of quality in the work done by trade firms for photographers. In both cases the quality is more or less accurately reflected in the price which is charged. A consideration of these facts should, we think, provide the answer to those who now and again urge upon our publishers that they should exclude the very low-priced firms from our advertising pages. An order for enlargements to one such firm may have been executed in what the disappointed maker of the negatives angrily calls a "disgraceful" style, on the strength of which, and without showing either the enlargements or the negatives supplied for them, it is protested that the firm should not be allowed to advertise its offers of service. As we have said, a complaint of this kind can only be made in the absence of a comparison between the price which has been paid and that charged by firms of the first or even the second grade. Probably the chief difference between low-price and high-price firms—a more essential difference than poorer materials and cheaper labour—is that their scale of prices does not allow them to repair defective work by doing it again. They send their first production unless its defects are too gross even for their standard, and hence the result is very largely a matter of chance. Like the little girl, and dependent on the negative, it may be very, very good or it may be horrid. If it be the latter, the purchaser must surely think that he could hardly expect anything else at the price. His case is paralleled by that of anyone who puts money in a high-yielding investment: he is buying something cheaply priced, and he takes his chances on it. No doubt the advertiser announces that his work is first-class, but then what advertiser does not?

* * *

A Lecture on Photography. Perhaps it is a welcome sign of greater general interest in technical and scientific matters, perhaps the result of the searchlight prominence of photography in the war, but we have lately received quite a number of requests that we should name the book to be recommended to anyone anxious to deliver a popular lecture on photography. The fitness for his purpose of a would-be lecturer who finds it necessary to put the question may be doubted, but at any rate the inquiry exhibits a praiseworthy desire for information, and doubtless there are many with a thorough practical acquaintance with photography who are not too self-confident to see that much more is demanded of a lecturer on the subject. For such as they a book which provides a serviceable basis of information is Mr. Chapman Jones's "Photography of To-day," a volume which reviews past and present photographic processes in a popular yet scien-

tific way. On the very earliest history of the art, that is the work of Niépce, Daguerre, and Talbot, reference may be made to a series of papers which ran through "The Photogram" for 1900. There are one or two issues of "The Photo-Miniature" which will usefully provide material, viz. those on "Who Discovered Photography?" "Colour Photography," and "Aerial Photography," and as a means of taking a bird's-eye view of the successive stages of photographic progress there is the monograph "Photography, Past and Present" issued as an illustrated supplement to the Diamond Jubilee Number of the "British Journal."

* * *

Focussing Sharply. In focussing originals, such as paintings, in which the absence of definite outlines presents a difficulty, most photographers make use of a small printed card placed against the surface of the original in order to provide a workable test object. But perhaps it is not so generally recognised that different types of lens require different treatment in order to obtain the best results. As a rule, rapid rectilinears and other lenses possessing greater or less roundness of field give the best average sharpness when the test object is placed so that its image falls about midway between the margin and centre of the field. With most anastigmats it is best to obtain the greatest sharpness in the centre, and the margins will then frequently be sharper in the negative than they appeared on the screen. With all types of lenses great assistance can be given by a judicious use of the swing-back, both vertical and side movements being employed as needed. This is particularly the case when using a portrait lens at its full aperture; a swing of the back will allow of the same degree of good focus over the plate as could be obtained by a smaller stop. The method must not be abused, particularly when a short-focus lens is being used, otherwise the size of hand and feet in the sitting figure will be unpleasantly exaggerated.

* * *

Patent Specifications A correspondent who addresses a query to us raises a point which no doubt is now and again in the minds of many other readers of these pages. It is a matter of common remark that the published specifications of alleged inventions to which patent protection is granted are often things which are as old as the hills or, on the other hand, bear on the face of them certain practical disabilities. But the explanation lies in the fact that the preliminaries in the way of search which are carried out before the granting of the patent extend, not to books and periodicals where the invention very likely has been published, but only to patent specifications themselves issued during the period of fifty years prior to the date of application. Moreover, the Patent Office is not concerned with the efficiency of an invention. It takes the applicant's word for its merits in this respect. Apart from its search in prior specifications its work is not very much more than a registration of the description of the invention and the claims made in respect to it. The questions of efficiency and of prior publication are left to be the subject of investigation in a court of law in the event of any action being taken as to infringement. While there are thousands of existent patents which have not been the subject of this legal inquiry, it is nevertheless true that a patent has not received absolute certification of value until it has been examined in the Courts. Inventors of photographic appliances should not therefore set too high a value upon the fact that they may have been granted a patent for a particular appliance. Nevertheless, it is a wise and not very expensive precaution to spend, say, the matter of five pounds on obtaining protection for any invention before offering it for sale to a commercial firm. The patent rights can then be disposed of, and the cost of maintaining the patent defrayed by the purchasing firm if such is considered advisable.

THE EDUCATION OF ASSISTANTS.

Our title has nothing original about it, it has figured pretty frequently in the "Journal" lately, but as the question seems in rather a nebulous state, it is perhaps in order to inquire what it really means. In other trades it is not usual to employ the wide and comprehensive term assistant, but to specify the branch in which the employee is to be engaged. In letterpress printing, for example, we have compositors, linotype operators, machine minders, and warehousemen, and in each division a man is only expected to be proficient in his particular work; but in photography, except in very large establishments, this is not the case, and an assistant is expected to be able to turn his hand to any job which happens to come in his way, or in other words, if the reputation of the studio is to be kept up, to be as good an all-round worker as his principal and a better one in some particular section. That there are such assistants we very well know, and the photographer who secures the services of one is to be congratulated.

Now before starting any education scheme it would appear to be necessary to define the various classes of assistants and to set up some standard of proficiency for each. Another important point to be settled is that of remuneration, so that a youth or girl entering the profession should know what wage can be looked forward to when he, or she, has qualified as proficient. Many things besides scientific knowledge and practical proficiency are called for in everyday work. We have known amateurs capable of turning out prints which would do credit to any studio in the kingdom, but their pace has been hopelessly slow, and no employer could afford to keep them. Nothing but practice in a busy place can give the necessary smartness, and it is a question how this is to be obtained.

The old practice of engaging a juvenile as a sort of messenger and general helper with more or less opportunity to pick up a knowledge of photography will obviously be out of the question under the new régime. Proper teaching should start at the outset, and it is difficult to see how this is to be obtained in many localities. Let us take the case of an intelligent lad living in a small country town who wishes to become a photographer. The only course that is open to him is to obtain work in the local studio with a man who can just manage to make a negative and print it sufficiently well to pass muster with a not too critical class of customers. When the lad begins to want a living wage he looks further afield, only to find that he is one of the incompetents whose existence we all profess to deplore, but who provide a source of cheap labour for the sweaters who, as in all other trades, are found in photography. If we are to have well-trained assistants there must be sufficient inducement for them to be trained in the same way as chemists, engineers, lithographers, or dental mechanics, by a proper system of apprenticeship or pupilage, supplementing their workshop practice with a part-time training in the scientific aspect of their work. The latter cannot be given in a house of business without serious waste of time, so that something on the lines of the Fisher scheme of education must be adopted, and it is for the masters to co-operate with the local authorities to secure this. But such a scheme is only workable with very young people; after the age of eighteen it is very difficult to find that readiness to assimilate knowledge that is natural to the schoolboy. It is easy enough to teach youngsters of fifteen to eighteen such subjects as elementary chemistry, optics, or even art principles, but

if those three precious years have been wasted, the mind takes another turn, and learning becomes laborious. Moreover, a bad way of working is acquired, and this is often felt to be sufficient. There is now also the sex question to be considered, as a great change is coming over photography by the invasion of women into almost every branch. Are the assistants of the future to be male or female? Already men returning from army service are finding that situations are not so easily obtained as they had expected, and we look for still further developments in the same direction. Only a few years ago, and women were considered as greatly inferior to men as retouchers. What is the position now? The same thing is going on in other branches—printing, dark-room work, and even in studio operating—the only field in which male labour is unchallenged being that of outdoor work.

Still, male or female, we must have assistants, and the initiative for their training must come from the master photographers. Their first problem will be to find instructors, the second to find a body to hold examinations and grant certificates of such a degree of proficiency that the holder can secure a standard wage. In the organisation of the chemists and druggists we have an excellent model. In this profession a youth enters as an apprentice, is given time for study, usually takes a course under a coach, and finally passes his minor and major examinations before he can hope to attain a position as a "qualified assistant." One of the greatest factors in producing a shortage of good assistants is the ease with which a competent worker can start on his own account in a small way. If we can offer such terms as will keep good workers in their situations we shall have accomplished much.

PRACTICUS IN THE STUDIO.

STUDIO ACCESSORIES AND FURNITURE.

In no respect does the modern style of studio differ more from its predecessors than in the matter of accessories, and we might treat the former in the same way as did the writer of a book on Iceland. A chapter was headed "Snakes in Iceland," and the chapter consisted merely of the words, "There are no snakes in Iceland."

When we speak of accessories it recalls to the old operator the wonderful combination sets in papier mâché on a wooden foundation which gave pedestals, balustrades, stairs, bridges and a host of other things as they happened to be arranged, or the equally wonderful pieces of furniture which professed to represent a piano, a writing-table, a bookcase, and a seat, and deceived nobody. Then we had rocks, stone walls and loose boulders which were sometimes useful, not to mention ships' masts, boats, and swings. These have now, happily, found a resting-place in the lumber-room or have helped to relieve the shortage of coal in these upside down times. Still one cannot but help feeling that the accessories themselves were not alone to blame for artificial-looking pictures, the unintelligent and mechanical way of using them being equally to blame. I believe it to be possible that we shall again revert to the use of more accessories in the true sense of the word, when someone finds it necessary to be "original" and to produce something to relieve the severe simplicity of the head and three-quarter length portraits which are now the vogue. The modern portraitist is not likely to fall into the errors of his predecessors, as he has learned to concentrate the interest in his pictures by subordinating unnecessary detail and would not think of making a negative in which the surroundings were as brilliantly lighted and as sharply defined as the figure itself. Although they are somewhat out of favour at present I must confess to a liking for full-length figures, and it is difficult to get these well balanced without introducing something to give the needed spot or mass of light and shadow which makes the composition complete. This is, of course, widely different from the old practice of building a zareba of plants and vases round a lady's figure, so often done by the bygone masters of our art.

A safe principle for the guidance of those who have to equip a studio is to follow the advice of Ruskin and to have "nothing except what you know to be useful or believe to be beautiful." Do not buy settees or chairs which no sane person would ever admit to a dwelling-house, but select every piece of furniture, whether intended for the studio, the reception-room or even the dressing-room, with a view to its suitability for insertion in a picture sooner or later. Variety, it has been said, is the spice of life, and variety in your work can be more easily secured if there is an ample choice in the matter of furniture. You will then steer clear of the error made by an American photographer whose confession I read a few years ago. He specialised in children's portraits, and when the twisted wicker chairs and settees were introduced invested in a fine specimen. Needing a new window display, he made a large canvas-covered panel, and fixed upon it a score or so of his latest and best productions. It was set up in the window and he went outside to judge the effect; when he viewed it he said that all he could see was twenty wicker settees with babies on them. A sadder and a wiser man, he went inside and promptly dismantled the show from which he had anticipated so much.

Much of the charm of "home portraits" is due to the natural posing and the judicious inclusion of furniture and ornaments which are associated with the sitter in the minds of his friends. A scholar taken in his study appears more at home than he does against a plain dark background, and in the case of people who, as an old friend of mine said, "are more distinguished by their facial peculiarities than by actual beauty," there is a real advantage in having something beside those "facial peculiarities" to rest the eye upon. In studio portraits therefore we should endeavour to reproduce the home atmosphere as nearly as possible and to avoid giving the impression that the whole thing is a make-up. If it be desired to make a picture of a man at his writing-table, the general idea seems to sit him at a small polished table with one or two pieces of paper and a small ink-bottle and pen borrowed from the reception-room. Such an arrangement is little better than the Oriental method of arranging theatrical scenery, in which one painting does for all the scenes, with the addition of a label to tell the audience whether it is a palace or a forest.

When selecting chairs or settees they should be chosen not for the beauty of their design when empty but for their appearance with a person seated in them. It will frequently be found that the arms are too high or that the curves are such that a graceful pose, especially of the forearm and hand, cannot be obtained. Many chairs are far too low in the seat and have either to be made up with loose cushions or by fitting rather high castors to the legs. It is, however, necessary to have some low chairs for short people, but with ordinary-sized sitters a better pose of the shoulders is obtained by using a chair rather higher than usual. Settees are best of normal height, as in them a more lounging pose is usually

wanted, so that all that is necessary is to avoid the special photographic patterns, except those of the garden-seat pattern, which are useful for sketch or outdoor effects. That much-maligned article the pedestal has had its day: It was hard-worked and has earned a rest. It has a useful successor in the flower or vase stand, which is very handy with standing figures, which would look a little lonely without it. It should never be used for the sitter to lean against, but with ladies' portraits may be used to support a bouquet or a vase of flowers which the sitter is arranging. It may also be used to hold the busby or helmet of an officer in full dress, to avoid the necessity of holding it in the hand or omitting it from the picture, to both of which there are serious objections.

Children's portraits permit of the use of many simple accessories, especially for outdoor effects. I made a very useful tree-stump of a lard bucket carefully covered with virgin cork, so as to give the effect of living bark, the lower ends being well spread so as to appear like roots. This with a cylindrical hollow "log," covered in the same way, afforded many excellent poses and did not look artificial. If the cork had been stuck on anyhow the things would have been useless. When working with these or other outdoor accessories a pail of coarse sawdust, the dirtier the better, is a great help. If a painted floorcloth be laid on the floor and the sawdust scattered over it, it looks like sandy earth and will show foot-marks, while it can be piled round the bases of such accessories as I have mentioned.

A baby-holder is an accessory which should be in every studio that is not exclusively devoted to adults. It may either be of the American or clip variety, in which the child's garments are caught in clips attached to an upright post, or it may be like a triangular seat with a low back and a hole through which the child may be held by a person behind. I have found a broad tape, which could be passed round the child's waist and fastened at the back of the holder, a very useful addition. Such holders are, of course, only intended for babies who can just sit up, and could not be trusted in an ordinary chair; besides, it permits the feet to be shown nicely.

Although I am more inclined to class them with apparatus, certain studio appliances are often called accessories. The head-rest is one, and one which I should be sorry to dispense with. Some care is necessary in choosing and handling this instrument. In the first place it should not be heavy, and in the second place it should be simple. What is needed is a support which can be quietly placed behind the sitter (or usually stander), and adjusted so as to give the necessary steadiness. I may say that I rarely place the rest to the head, finding the shoulder or lower part of the neck to be a better position and less embarrassing to the sitter. The number of plates which are wasted on standing poses through "moves" by photographers who consider the head-rest out of date must be enormous. All the moving parts should be kept, like a rifle, bright and oiled where necessary, so that there is no jerkiness in action. Another necessary which I consider indispensable is the head screen. This needs no description, but the covering demands a few words. Most head-screens are covered with a sort of lawn, and this is generally useful; I have also tried light blue nun's veiling, nainsook, and tracing-cloth, as well as butter muslin: these all have different light-arresting powers, and the user must choose for himself if he does not find the stock covering to his liking. A black gauze is sometimes used when it is desired to cut off light without diffusing it. Such a screen is very useful for toning down white draperies without losing the modelling. The reflector also needs no description. As far as its qualities go it should be light in weight, not too large, and capable of being adjusted to various angles. As a rule the surface is too light when purchased, but this defect soon disappears. When the surface gets very grey the material should be washed, but if it cannot be readily detached from the frame it may have a dressing of Blanco, a sort of pipeclay used by soldiers and for tennis shoes.

To revert to our original subject of accessories which appear in the picture, I would point out that modern printing and enlarging methods offer such opportunities for control that many of the old negatives which gave meretricious results in albumen or gelatino-chloride would give quite artistic prints upon rough paper with the sharp offensive lights toned down. Uniform sharpness throughout the negative is no longer considered as desirable, so that any falseness of texture in the accessories is not shown in the finished picture. Finally, do not overcrowd your composition; do not use more accessories than are needed. If not needed, do not use them.

PRACTICUS.

THE FUTURE OF AEROPLANE PHOTOGRAPHY.

[The following article, which we reprint from our American contemporary "Aviation," very properly raises the question of the commercial future of photography in the air, in which there are certainly as great possibilities as in aerial navigation generally. The fact that one of the authors, Mr. L. J. R. Holst, is a camera designer and instructor should emphasise to manufacturers of apparatus the field which is opened by the application of aerial machines to practical methods of surveying.—EDS. "B.J."]

THE commercial future of aeroplane photography is not generally appreciated by aeroplane builders, since they have not as yet realised that preliminary surveying of high-roads, railroad, and other through routes can be done quicker and more cheaply by aeroplane photography than by any other known method. This is largely due to the circumstance that cameras have been hitherto considered as instruments of mere detail in the aeroplane industry as a whole, while as a matter of fact they will probably become one of the most important factors in the development of commercial aviation.

The most fruitful field of commercial work for the aeroplane camera in the United States will undoubtedly be the completion of the topographic survey of this country, which work includes the complete detailing of maps not yet complete, as well as the mapping of territory which till now has not been charted at all. To this already extensive programme should be added the locating of the high and low water lines along our coasts, besides work of more local interest, such as the production of correct maps of smaller communities for real estate records, the location of sites for dams for irrigation purposes, locating railroads and waterways through mountainous country, establishing aerial routes and emergency landings in vast wooded tracts, etc., all of which work can be done in a fraction of the time, and hence for a fraction of the cost entailed by a complete manual survey.

It should, however, not be understood that the aeroplane camera renders manual surveying obsolete. On the contrary, it is recognised that the camera does its most effective work in connection with the slower but extremely accurate work of the surveyor, each one being checked up by the work of the other. In fact, it may be stated that the camera furnishes the filling-in details to a degree of perfection not attainable—or, at any

rate, not obtained—by manual survey, whereas the latter produces a series of exact points of location which serve as control points for the data furnished by the camera.

To obtain useful commercial mapping results from an aeroplane requires different methods of operation than those used to make the so-called mosaics, because maps will be made between control points often many miles apart, between which it will be necessary to fill in not only the general ground plan but also the contour lines.

As a matter of fact, the mapping use of aeroplane photography has been to a certain extent set back by the war, for the reason that certain scientific views, which are not relevant to commercial photography, rather held the foreground. These were questions of emulsions and lens-openings, neither of which are really of as much importance as the purely mechanical sides of the problem.

Since all work enumerated before it, this article is strictly of the order of map-making, only such photographic apparatus as is adapted to this class of work need here be noted. This excludes all hand-held or hand-operated cameras as well as any semi-automatic or non-automatic instruments which are rigidly attached to the aeroplane, since they partake with it in all its deviations from a perfectly horizontal position while in flight, a condition which is entirely incompatible with results for map-making. This leaves thus the freely suspended type of aerial camera for further consideration.

The military use of the aeroplane camera during the war has led to developments which do not necessarily form correct precedents, because of the assumption that an observer is essential. This has led to undue emphasis being placed on hand-operated or semi-automatic cameras, which were to be of such simplified construction that no imperfect functioning would occur under the hands of the operator-observer. These military conditions do not prevail, nor apply, in commercial aeroplane mapping.

A division of opinion has existed relative to the automatic functions of aeroplane cameras among the Allied Governments, but in no case were these differences caused by the requirements of aerial photographic mapping.

Paramount importance was attached to the chemical side of aerial photography, much attention being devoted in particular to the perfection of colour sensitive emulsions, to more readily detect camouflaged objects from the real ones.

No doubt this aim is worth while, but since existing emulsions used with suitable ray filters were apt to produce, under the rough-and-ready conditions of actual field photography behind the lines, similar if not better results, with a far greater degree of likelihood to get any results at all, it must be regretted that these efforts placed the much more important mechanical side of the problem entirely in the shadow.

As long as the question of aeroplane photography was a question of filling in maps with nearby control points the detail design of the camera was not of the highest importance. To take a series of views over well-known ground is a problem comparatively simple, but commercial applications of aeroplane photography require more definite information in regard to drainage, divides, and general contour information, as otherwise the main benefits of rapid surveying cannot be obtained. Photographic aeroplane surveying will unquestionably be used largely as a supplement of the Photo-theodolite and other more common methods of surveying, to fill in between control points established by the older methods. But in the case of the more or less unknown country between control points established by the more common methods, and for such works as coast surveying, arises the greatest need of aeroplane survey.

Surveying to be done from an aeroplane, particularly for filling in large areas, must be obtained by means of an automatic camera. On considering the problem of commercial aeroplane photography it will soon be possible to pick out the necessary elements of design, and why an automatic camera should be used.

All photographs to be used in map making must be a true horizontal projection of the earth's surface. In this way all points are practically reproduced by the photograph on a scale which is equal to elevation divided by focal length of the lens. If the plane of the photograph is not approximately parallel to the plane of the earth's surface (not considering the curvature of the earth), positions will not be correctly rendered; there is distortion to location which is equal to the cosine of the angle of inclination. In actual military practice, however, any camera installation which fastens the camera to the plane so that in the average flying position the camera is approximately horizontal was considered sufficiently good for purposes of making mosaics.

Contour Mapping

However, this is by no means an answer to the question of obtaining survey information, as in the case of obtaining contours from aeroplane photographs these can only be done by making use of the lens axis of the camera. The only way of establishing a true parallel position of the negative to the assumed plane of the earth is by means of the vertical position of the axis of the lens. Moreover, the only known factor for determining contours needed is the angular relation of the axis of the lens and its true focal length. With these two known factors the position of the earth can be graphically reproduced, and by ordinary drawing instruments a series of exposure points in the air can be determined. These exposure points are then used by transference of angles to reproduce graphically the location of points on the ground in space above or below the base line, which is usually taken at the foot of one of the axial points of the series of photographs.

To obtain a vertical position of the axis of the lens necessitates a free suspension of the camera in the body of an aeroplane where it is not affected by the air current in motion. This is easily done by putting the camera in the Gimbal suspension similar to a ship's compass. However, it is necessary to maintain a constant position, as otherwise the variation in the rate of motion of the aeroplane through the air would introduce a pendulum action in the camera. There are only two ways whereby this can be done first, the use of a gyroscope, and, secondly, the use of gravity and suitable air cushions to prevent oscillation, but at the same time to allow motion relative to the swinging plane. In practice the latter method is the better, as it introduces no mechanical complications, and the accuracy resulting is close enough for mapping purposes.

In addition to the requirements of angular position, aeroplane photographic surveying requires a large number of photographs in a single flight. It is next to impossible to change plate magazines or to fill holders in flight sufficiently rapidly to obtain an unbroken series; moreover, it is necessary that photographs should be taken at what is practically a constant interval between exposures; if not, there is very apt to be a break between two successive exposures which requires an additional flight to obtain the necessary information with which to fill the gap.

In a military sense, during the recent war, this matter was not of such importance as it becomes for photographic surveying, for the reason that usually photographs were wanted of a single spot only, and intervening places were not necessary, although at times desirable. This has led to the use of film cameras using roll films having as many as 100 exposures to each loading.

The principal difference between different makes of cameras for purposes of making military mosaics are usually matters of obtaining necessary power to change plates or film negatives.

Three methods of obtaining power have been used: the air fan, electricity, and spring motors.

In considering the design features of the camera it is very necessary to know to what extent photographic surveying will be carried out. If military mosaics are required, which generally are used simply to fill in small areas, a semi-automatic, regardless of form of drive—even a hand-operated camera—may be useful. If contour surveying is to be done it becomes necessary to have a very accurate timing device for the interval between exposures, as otherwise the overlapping relations between exposures will very easily be lost. The European continent is so thoroughly surveyed that the contour method has been very little used, and in the considerations of the necessary types of cameras, contour mapping has not been considered an essential feature. For this reason the so-called automatic or semi-automatic camera ordinarily in use is not completely automatic, but simply is a power-driven mechanism which changes a plate or film negative and in which the actual exposure is made either by the pilot or observer. There is only one completely automatic camera in existence which operates at varying rates of speed, controlled with certainty either by the pilot or the observer. This camera—the Brock camera—will be described later in detail.

The Triple Lens Camera.

When making flights for map-making purposes a given area of ground can only be fully covered if a number of flights in parallel courses are undertaken, each new flight following a course just overlapping the strip of land covered by the previous flight. The number of flights required to cover a given width of territory will then be directly proportional to the width of the strip embraced by the photographs, and consequently it is desirable to embrace as wide a strip of land as practicable in each view.

This consideration has led to the construction of triple lens cameras, the central lens pointing straight downward, and the lens on either side placed under an outwardly slanting angle. These three lenses are in one vertical plane at right angles to the direction of flight. The image-planes of the outer negatives are then usually set at an angle of 45 deg. to the central lens. These cameras are arranged for rigid attachment to the aeroplane. The two outer lenses will then produce pictures of strips of land extending far out at each side of the line of flight, whereas the central lens registers the views directly beneath the aeroplane and immediately adjoining regions.

Although this arrangement undoubtedly covers a width of territory not obtainable with a single lens, it introduces difficulties which seem to far outweigh its possible advantages, and at its best it is only suitable for use on fairly flat ground. The complications arising from three different planes of projection, and the necessity of afterwards reducing the two outer planes to that of the central one, without definite knowledge of the actual position of either plane at the instant of exposure, constitute serious obstacles to the usefulness and commercial adaptation of devices of this kind.

Timing Exposures.

It seems now preferable to obtain increased width of the strip of land depicted on the photograph by increasing its width and reducing the focal length of the lens, both to such limits as sound photographic and optical practice allow. A camera arranged to take negatives 5 x 7 ins., the 5-in. side in the line of flight, and equipped with a lens of 8 ins. equivalent focus, embraces at 5,000 ft. elevation on each picture a strip of land 4,375 ft. wide and 3,125 ft. long on a scale of 1/7,500, or, if elevated to 6,666 ft., would produce pictures on a scale of 1/10,000, embracing 5,833 ft. in width by 4,166 in length. Most of the high-grade lenses at 8-in. focus and openings of $f/5.6$ will cut a 5 x 7 in. image sharp and without distortion, and are serviceable for such work.

The succeeding exposures should be timed at intervals of distance depending on the elevation and corresponding length of ground taken by the picture. The speed of the flight translates this distance interval into a corresponding time interval. It is thus desirable to provide means by which the actual time interval can be varied according to these conditions, and which will operate with dependable precision in its various adjustments

As the manufacturers of the Brock Automatic Camera, it is probable that our actual experimental work in photographic surveying and in the design of cameras to obtain these results has been carried far beyond experimental work in this line by any individuals or by any of the Governments who have participated in the European war. The system of installation which we use has been found to permit exposures of from two to five times the exposure possible with any other system of installation, with all its attendant benefits. No other camera has been successfully built with a system of free suspension, with the result, also, that no other camera has been built which can also do contour surveying. The importance of contour surveying in a military sense was becoming recognised as the war drew to a close, and consequently this field of endeavour has had but a fraction of the effort put on it which will be devoted to it in the next few years.

Another feature of camera design which originated with the Brock camera was the use of film for military purposes. The Brock film camera has been made successfully to use film in two sizes: one 4 x 5 ins., using ordinarily a 12-in. lens, and one 8 x 10 ins., using a 24-in. lens, both types completely automatic. These cameras were the first ones used which entirely eliminated static electricity in the film, and are to-day the only ones in which static electricity never occurs. The system of obtaining large negatives on film without distortion through the use of a glass support originated with the Brock 8 x 10 in. cameras. However, the use of the large negative sizes will be confined to military purposes, as for commercial or ordinary Government mapping a very large scale is not required.

The Brock Camera.

Let us now consider some of the mechanical details of the Brock 4 x 5 in. camera and the reasons for the design. This camera is the outgrowth of a series of experiments to obtain a free suspension camera, motor driven, within reasonable weight, certain of operation, and controlled from a distant point, for use in a single-seated aeroplane.

Mechanical experiments led us into the design of the spring motor-driven cameras and resulted in our finding commercially feasible means of controlling the speed of operation of the spring motor not in any way dependent on friction. The entire engineering profession is aware of the difficulty of obtaining a satisfactory variable speed friction drive which includes both certainty of operation and certainty of speed. In the case of a spring motor this difficulty is emphasised because the control through friction must be done by the introduction of a governor. Such a construction results in absolute loss of control of speed regulation owing partly to the different percentage of friction due to moisture in the air in varying amounts. The system we use, therefore, is the control of the main spring motor by means of an auxiliary spring motor, which is in effect a clock with a speed regulation of $3\frac{1}{2}$ to 1. The importance of accurate speed control in the case of the Brock camera is greater than in any other camera, because of its ability to produce contour maps. Wherever it becomes necessary to obtain contours the axial point of the succeeding and the preceding negative must show on each exposure, with the result that exposures must occur at frequent and constant intervals without interruption, other-

wise a break in the sequence will partially destroy the value of the contour photographic flight.

Without any exceptions worth mentioning, all aerial cameras are fitted with focal-plane shutters, as the high efficiency of this type of shutter, together with its extreme mechanical simplicity, renders it superior to the between lens shutter. In the Brock cameras focal-plane shutters are provided with a fixed slot, the speed adjustment being obtained entirely by means of the spring tension. Speeds are variable from 1/50 to 1/200 of a second, or any similar range.

Shutter Speeds.

In connection with shutter speeds of aeroplane cameras it is of particular interest to mention that, owing to the almost complete absence of vibration obtained with the gimbal-suspension, shutter speeds can be regulated entirely with regard to the elimination of image movement through travelling speed, and no regard need be paid to the effects of vibration. The requirements due to speed are very easily met. For instance, a camera as already mentioned, fitted with an 8 in. lens, flying at 5,000 ft. elevation and at 120 m.p.h., requires no faster exposure than 1/20 of a second to give a sharpness corresponding to a circle of confusion of 14/1000 of an inch, and with a speed of 1/50 of a second the circle of confusion will be only 5.6/1000 of an inch. This means that the gimbal-suspension camera has the practical advantage of being able to photograph both earlier and later in the day than would be practical with rigidly suspended cameras, which are generally used with minimum exposures of 1/100 of a second to eliminate as much as possible the effects of vibration. It also means that such focal-plane shutters can be made with wide slots to reduce the duration of the exposure period, and thereby the resulting distortion, to a perfectly negligible minimum, which in turn eliminates the only seeming valid arguments against focal-plane shutters.

Evenness of Exposure.

A perfect evenness of exposure at all speeds can easily be obtained by proper design of the focal-plane shutter, in fact, so that the slightest difference in exposure plainly seen in aeroplane films, since maximum and minimum density adjoin in two negatives of a strip of continuous pictures side by side, will show no observable variation. Especially in civil or commercial uses of aeroplane photography do these various features come to their fullest significance, and it is only on this account that they have been mentioned in detail.

Summarising, the status and development of aeroplane photographic surveying is an art still in its infancy. Unless the aeronautical trade recognises the possibilities of this use of their product, and unless the engineering profession of the business realise its possibilities it is not likely that the growth will be rapid. It is an unfortunate fact that up to the present time the energy devoted to the constructive surveying features of aeroplane photography has been confined to, and understood by, only a few people.

The truth of the matter is that, in the first place, the emulsion questions which have arisen in Europe are really matters of no serious consequence, although a considerable amount of time and effort has been spent to change and to make special emulsions. Efforts have also been made in Europe to make emulsions sensitive to certain colours, whereas similar, if not better, effects could have been obtained with existing emulsions by the use of a colour screen and lengthened exposures. Whatever efforts have been made in the mechanical direction, they have been very largely in the direction of making a camera which could be operated by the average observer without any knowledge of photography or of mechanics. It is safe to say that if the motion picture industry which is now in existence had had a miltary use and military development, the present stage of perfection would never have been reached, as the mechanical side of the motion picture industry has received a tremendous amount of attention for years. High-class motion pictures cannot be made by anyone but a skilled operator, and in exactly the same way the success of the future of aeroplane surveying is dependent upon operators learning about the necessary photography and mechanics of aeroplane cameras; but it must be recognised for the future of aeroplane surveying that apart from the development of the negative and the printing of the prints aeroplane photography is a matter which should be entirely in the hands of civil and mechanical engineers.

Aeroplane Photography and Commerce.

The modern aeroplane has reached the stage of development where the safety of operation and the certainty of operation are as good as of the average automobile of ten years ago. This means that an aeroplane can be used to fly for some hours over entirely unknown country without any landing places; it further means that such country can be completely and correctly mapped without difficulty and at a very low expense compared to the present-day methods of surveying. It is quite possible that in the future preliminary surveys will be made for railroads, roads, and various water-works entirely by aeroplane photography, and that when the line has been decided upon a party will go out simply for the purpose of staking agreed-upon lines. If the aeroplane industry will devote as much attention to this subject as has been devoted to other commercial possibilities, a rapid growth can be expected. As foundation-stones have been laid, it is only necessary for a general interest in this subject to be awakened by the aeroplane industry before its possibilities, first as a Government enterprise, and then as a commercial enterprise for civil engineers, will find general recognition.

ARTHUR BROCKER, JUN.
L. J. R. HOLST.

Assistants' Notes.

Books on Colour.

ASSISTANTS who mean to make photography their profession should look into the question of colour, as pictorial art of the future will be intimately concerned in the study; some authorities—particularly those connected with the vast textile industry—declare the future is bound up with it. Students of painting are bidden to study nature secrets, but students of photography will find the scientific side profitable and to their liking. Since 1835 over sixty books have been written, a fourth of that number being published in London, a fifth in New York. The Americans, by their productions of the last ten years, promise to surpass us on all points—by numbers, high prices they command, complete range of subject, interest, and research. As all books of recent years seem to be written round Rood's "Modern Chromatics," students will do well to commence with that treatise, as it contains valuable information, clearly written, well illustrated with woodcuts and diagrams, but unfortunately has no colour plates to assist the text. This book having passed through many editions, a clean secondhand copy is more often seen than any other, and is worth looking out for.—BURLINGTON.

A Reliable and Permanent Method of Intensification.

MANY photographers would be glad to banish mercury from their dark rooms if they could find a satisfactory substitute for it. Those who use the mercury intensifier know that they cannot depend upon the negative being any use in a year or so, and, although they have tried the chrominm method, the danger of yellow stains has caused them to go back to the old process again.

With papers of the "Cyko" class it is essential that the negative should be free from all stain, or the time of printing will be unduly prolonged. The following method of intensification has been in use in a well-known North-Country studio for some considerable time.

and may be depended upon to be stainless in its action and to give an absolutely permanent result.

Make up four solutions :—

			Water.
A.	Potass. bichromate	150 grains	10 ozs.
B.	Potass. bromide	400 grains	10 ozs.
C.	Hydrochloric acid (pure)	200 drops	10 ozs.
D.	Potass. metabisulphite	2 ozs.	10 ozs.

For use, take equal parts of A, B, and C. Bleach and immerse (after a brief rinse under the tap) in D solution until the yellow stain is completely destroyed. The negative is then re-developed in any non-staining developer without bromide, Azol or a paramidophenol mixture being especially suitable.

The method is equal to mercury in every way, with the additional advantages of being permanent, and that it is not necessary to eliminate all the hypo in the film previous to bleaching.

Buy pure chemicals, mix in the proper proportions, and use as directed above, and you cannot fail to get good results.—J. M.

Advertising by Airbrush.

An American soldier, by trade a sign-writer, was recently making comparisons between this country and his own on questions of advertising, and, although we pointed out that the war had stopped experts here as well, he pointed out the difference between the stylish window tickets of City tailors, shaded in colours by the airbrush, with the old-fashioned printed silver letters on black in a studio showcase, and he could see no evidence that we had ever made use of striking designs and methods as are tried in America. He criticised photographers, and guessed that the majority had an artist and an airbrush on the premises, and yet they do not make use of the instrument at all for stencilling through and shading round a design, or even a little ground tint to letters calling attention to the studio's particular style, or inventing an attractive price-list panel for the window. American schools, such as the Detroit School of Lettering, use the airbrush largely for advertisement purposes, believing in colour and design as a means of arresting the eye.—Burlington.

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Applications, January 27 to February 1.

Projection.—No. 2,158. Devices for use with optical apparatus for projecting pictures upon a screen. T. Burns, F. Palmer, and E. F. Stidder.

Shutters.—No. 2,066. Devices for automatically releasing lens shutters of photographic apparatus. D. Friedmann.

Aerographs.—No. 2,046. Detachable colour cup for aerograph handpieces. R. Heeley.

Colouring.—No. 2,214. Colouring photographs, engravings, etc. S. T. T. James and J. MacDougall.

Cinematography.—No. 2,512. Re-winder for cinematograph films. A. E. Jones and C. F. Lane.

Cinematography.—No. 2,521. Cinematograph shutter. S. W. Pilling.

Projection.—No. 2,501. Picture-projecting apparatus. I. Serrurier.

Cinematography.—No. 2,027. Cinematograph films and manufacture thereof. J. E. Thornton.

Colour Cinematography.—No. 2,028.—Cinematograph colour films. J. E. Thornton.

Trade Names and Marks.

APPLICATIONS FOR REGISTRATION.

W. B. Design.—No. 385,673. Photographic chemicals. White Band Manufacturing Co., Ltd., 121, Selsdon Road, South Croydon, Surrey; manufacturing chemists. October 17, 1918.

Metagol.—No. 387,084. Photographic developers. Society of Chemical Industry in Basle (a share company organised under the laws of the Swiss Republic), 141-227, Klybeckstrasse, Basle, Switzerland; manufacturers and merchants. December 21, 1918. Address for service in the United Kingdom, c.o. Abel and Imray, 30, Southampton Buildings, W.C.2.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Saturday, February 22.

Edinburgh Photographic Society. Opening of Exhibition.
Huddersfield Naturalist and Photographic Society. Lantern Lecture: "Features of Yorkshire Bird Life." R. Fortone, F.Z.S.

Monday, February 24.

Bradford Photographic Society. "The Craven Highlands." F. Whitaker.
City of London and Cripplegate Photographic Society. "Snow Pictures." S. Coulthurst.
Dewsbury Photographic Society. Exhibition of Members' Prints. Private view.

Tuesday, February 25.

Halifax Scientific Society (Photographic Section). "The Amateur Photographer" and "Photography" 1918 Prize Slides.
Leith Amateur Photographic Association. Social Meeting, with Whist.
Dennistoun Amateur Photographic Association. Whist Drive.
Hackney Photographic Society. "By Train to the Land of the Midnight Sun." W. Sanderson, J.P.
Dewsbury Photographic Society. Exhibition open to the Public.
Chelsea Photographic Society. "A Loon in London." W. L. F. Wastell.
Manchester Amateur Photographic Society. "Views and Vagaries of an Inexpert Photographer on Photography and Art." J. W. Richards, M.A.

Wednesday, February 26.

Croydon Camera Club. "The Potentialities of the Pinhole." B. J. Rose.
Ilford Photographic Society. "Another Chat on Pictorial Photography." S. Brigden, F.R.P.S.
Photomicrographic Society. "Internal Structure of Metals. Dr. B. P. Haigh.

Thursday, February 27.

Liverpool Amateur Photographic Association. 1,000 miles Around Britain by River and Canal. Spenser-Jones, M.Sc.
Brighouse Photographic Society. Lecturettes.
Hammersmith (Hampshire House) Photographic Society. Members' Outing, Print and Lecturette Competition.
Hull Photographic Society. "A Photographic Autobiography" and Y.P.U. Portfolio. W. M. Lyth.
Rodley and District Photographic Society. "Beginners' Pitfalls." Mr. Marston.
Chelsea Photographic Society. Dark Room.
Wimbledon Camera Club. "Some Experiences of a War Correspondent." H. C. Beckett.
Richmond Camera Club. "Monoliths." P. Varley.

Friday, February 28.

Dennistoun Amateur Photographic Associations. "Lantern Slides. R. Wallace.

ROYAL PHOTOGRAPHIC SOCIETY.

Meeting held Tuesday, February 18, Mr. W. B. Ferguson, K.C., in the chair.

Mr. S. R. Williams delivered a lecture on "A New Process of Printing on Paper in Natural Colours," accompanied by a demonstration of certain parts of it. Briefly, Mr. Williams' process consists in making at one exposure with one lens a negative recording all three colour sensations in a series of bands as in the Joly colour screen plate. The banded colour screen of red, blue, and green lines is placed against the panchromatic plate in the well-known manner. Having made this negative, Mr. Williams places it in an enlarging lantern after having applied to it, in a special lantern stage, a key-plate consisting of parallel bands each double the width of those in the negative, separated by a space equal to the width of a single band in the negative. A fine link adjustment in the negative stage enables him to bring the lines of negative and key-plate into parallelism and then to move the key-plate so as to cut out the bands corresponding with any two of the colour sensations, and to project those of the third upon bromide paper on the easel. The difficulty in this operation of knowing which set of bands is that of a given colour sensation is removed by Mr. Williams by a series of distinctive marks made in the first instance on the colour screen plate and thus imprinted upon the negatives. The lecturer showed, by means of a large-scale model, how very easily this indentification could be done. The key-plate in its special stage is thus twice moved through the width of a line and three bromide enlargements made representing the red, green, and blue-violet sensations. Here, as Mr. Williams pointed out, the process could be continued in many different ways. The bromide enlargements were amenable for the production of colour component prints by the Radex process; they could be employed as originals for pinatype or with some modification for the Sanger-Shepherd process. But his own choice was to make the three colour impressions by the bromoil process and to assemble them by a very simple method of transfer in registration. The bromoil print from the blue negative after bleaching was pigmented in yellow, and the impression transferred to drawing paper. The blue impression from the red

negative was first produced in pigment on the bromide print and then transferred to the yellow print by laying the second print down in registration and subjecting to pressure. The red impression from the green printing negative was transferred in like manner, and the whole process of making and assembling the three colour impressions could be done in about half an hour. Mr. Williams had found that ordinary drawing paper yielded colour prints, the shadows of which exhibited excessive opacity. He was seeking to remedy this defect by coating the paper with a mixture of celluloid varnish and oil containing a white pigment.

In some discussion which took place the lecturer explained that he registered the prints by means of a line made on the negative about midway along each side and thus impressed upon each print.

The absence of distinct blacks from the specimen prints having been noted, Mr. J. C. Warburg pointed out that such a production of black could not result in the process except from a spreading of the bands in each direction to the extent of their own width in making the enlargements.

Mr. Williams then proceeded to describe the means which he had used in making the colour screen plates himself. An immense amount of enthusiasm was created by the ingenuity with which the difficulties of inconstant light and irregularly working shutters were overcome. With a great fund of humour Mr. Williams entered upon the consideration of many practical devices, and on the proposition of the chairman the very heartiest thanks of the meeting were accorded to him.

CROYDON CAMERA CLUB.

In few societies do new members more rapidly become in spirit if not in fact old members, as is the case at Croydon. For in these no sooner had Mr. H. S. Newcombe appeared on the scene than he was offered and undertook the duties of lantern-st, no sinecure with an alternating arc. Last week he gave a really interesting paper on "Toning Bromide Prints," and passed round many prints toned in various baths, with the formulæ neatly written on the back. These were mostly standard, but one print of a fine brown colour was obtained by just toning it blue in the usual way and then sulphiding.

In the discussion, which far exceeded the lecture in length, a number revived recollections of a demonstration on sulphide toning given many years back by the bright and festive John H. Avery, who is now no more. Mr. Harpur, with the innocent expression of a cherub, asked what would happen if only a rinse were given between fixing and bleaching. "The prints would seriously reduce in depth," said Mr. Avery. "Let us try," said the one without guile who had previously made the experiment in the quiet, and a print was cut in half, one portion receiving the usual washing, the other a few seconds' rinse. No reduction occurred with the latter, the only difference being that it was slightly colder in tone. Rather a fleer for John, who sought refuge in the adage that "one swallow does not make a summer."

Mr. Harpur agreed, and rightly, for all who manufacture photographic papers are aware that a procedure which may produce no untoward result at one time may be highly prejudicial at another, and accordingly issue instructions which are safe to follow under all ordinary conditions. A recent case in point may be of interest. The manufacturers of a certain printing paper were asked by a user abroad whether a certain procedure could be employed in lieu of the one recommended. The answer was in the negative. They were subsequently informed that the alternative had been tried, misunderstanding, and with complete success. Leaving out of the question of the possibility of a difference of opinion on the relative merits of results obtained, the explanation of the mystery is simple. The user being in a far-distant land was necessarily working with old paper, whose age enabled it to withstand a treatment which would have been fatal with fresh paper.

Some time ago the present august president, Mr. J. Keane, expressed a pious belief that he had secured finer sulphide tones by conducting the manipulations in red light. Mr. H. King, a professional never above considering a new idea, said he had tried it, the only difference discoverable being the fracture of a 20-oz. measure, which would not have occurred in white light. Many were interested to hear that very fine red-black tones could be obtained with sulphided prints. After sulphiding, the prints are washed for 30 minutes in 12 changes of water, and further toned in:—

Hypo	2½ oz.
Soda carbonate	30 grains.
Gold chloride	5 grains.
Water	10 oz.

and then well washed. Prints must not be dried previous to the gold toning.

Mr. S. J. Rose, who all were glad to welcome on his return from France, gave some highly interesting details of the heavy photographic rush work between intervals of "nothing doing." One observation of his came as a surprise; he stated in his section the use of amidol was forbidden for developing bromide enlargements, owing to its injurious action on the hands, metol-hydroquinone being exclusively employed; rather a reversal of usual ideas. Mr. V. Jobling said, having some weak lantern-slides he bleached them by the bichromate method, and added a mere trace (amount clinging to a stirring rod to be precise, or the reverse) of the sulphide bath to the re-developer. Added contrast, and a rich warm-black resulted.

In reference to uranium toning, Mr. E. A. Salt said that all bromide prints so toned by him in the past were now wrecks. On the other hand, platinotypes toned with uranium fifteen years ago and over showed not the slightest change in colour. Very beautiful warm blacks to foxy brown-reds were possible. Mr. J. M. Sellors said uranium toning now had rather a bad name, but once was the rage. He had a uranium-toned print at home thirty years old, and only recently had the first signs of the familiar metallic sheen appeared. This had been completely removed by india-rubber, as first suggested by their member, Mr. C. Welborne Piper. Personally, he rarely sulphided bromide prints as he indulged in "scratch work," and this revealed the underlying black. He preferred the old hypo-alum bath to more modern methods. Mr. A. F. Catharine, without visible effort, concurred. In his hands hypo-alum afforded superior tones.

A most hearty vote of thanks was accorded Mr. Newcombe, who is to be congratulated on an excellent lecture and a successful "first appearance."

EDINBURGH SOCIETY OF PROFESSIONAL PHOTOGRAPHERS.

The fifth meeting of the session took place on February 10, to which all the photographers of Edinburgh and district had been invited. There was a large attendance. Mr. Young was in the chair.

A letter was read from the Secretary of the Edinburgh Photographic Society intimating that the Council were desirous of inviting the Scottish National Salon to Edinburgh in 1920, and asking if the Edinburgh Society of Professional Photographers would be willing to participate. After some discussion it was felt that as the Professional Society had in view the holding of an exhibition of their own, and in the absence of any detailed information regarding the Salon, this matter should not be considered meantime, and the Secretary was instructed to write to the Edinburgh Photographic Society to this effect.

A letter from Messrs. Ovinus Davis was read, in which they requested information regarding the constitution of the Society. The Chairman read a letter from the Secretary of the Edinburgh College of Art intimating that the proposed retouching class scheme had not been passed by the board, and suggesting that photographers might perform their own tuition. Mr. Young then read the text of a memorial which he had drawn up, and which it was proposed should be signed by the photographers of the city and submitted to the board of the College of Art. The memorial, among other things, pointed out the impossibility of photographers instructing their assistants personally, and referred to the number of classes of various kinds included in the syllabus of the College, and which were no less removed from "art" than retouching. The memorial was unanimously accepted, and Mr. Campbell Harper expressed the Society's indebtedness to Mr. Young for the trouble he had taken in this matter.

The meeting then discussed the question of a minimum price for postcards. Mr. Campbell Harper suggested that, in view of pre-war price-cutting, a number of photographers should agree not to go below a certain price. People would go long distances to secure certain photographers' work, but not to secure lower prices. Mr.

Mackay suggested that a meeting of postcard photographers might be held to discuss the matter fully. A number of different prices were mentioned as being charged by various firms, and it was ultimately agreed, on the motion of the Chairman, that a recommendation be passed that no photographer should charge less than 6s. per dozen for postcards. This it was decided to communicate to all photographers in the district.

The holiday closing scheme was then discussed. It was thought that this year photographers should close during different periods, so that there would always be some studios available for the public. A minimum period of one week was proposed by Mr. Barrie and seconded by Mr. Campbell Harper; while Mr. Ferguson proposed ten days, as last year. Mr. Johnston proposed that these two motions should be allowed to lie for a month, during which time the Secretary would place them before the remaining photographers of Edinburgh and invite opinions.

It was intimated that a criticism of members' prints by a well-known artist would take place at the March meeting. Those present then signed the memorial, and the meeting closed.

Correspondence.

**** Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

**** We do not undertake responsibility for the opinions expressed by our correspondents.*

KINEMATOGRAPH.

To the Editors.

Gentlemen,—I think Mr. A. Lockett is wrong. Cinematograph was first a trade-name for Lumière's in 1891; bioscope an English name in 1894. Kinema was first used for an English patent in the 'sixties or 'seventies; since that time the English Patent Office classifies under "K." The oldest trade journal also goes under the name "Kinematographic Journal." My English standard dictionary, 1902, also says "K," and does not mention the Cino (which is pronounced sino, not kino)

The first kino consisted of a pack of cards, on which the successive movements of an object were illustrated by hand; when slowly released, as in the modern Mutoscope or Kinora, the kinematographic effect was produced.

The name is, therefore, typically English, and not of Germanic origin, as suggested; nor is Lockett, because it is written with "ck," and "ck" is looked upon as typically Germanic. KINO.

THE MERCURY-VAPOUR LIGHT.

To the Editors.

Gentlemen,—Referring to the correspondence on pink diffusers for the mercury-vapour light, I should like to say that I found a great reduction of the greenish tint without any appreciable lengthening of exposure. The colour used was quite a full rose pink; a paler colour did not seem much good.—Yours, &c., C. H.

Birmingham.

To the Editors.

Gentlemen,—Referring to the communication by Mr. Stanley Beaufort, which appeared in your issue of February 14, I may say that I used the mercury-vapour system exclusively about six years ago. The unpleasant appearance which the light imparted was certainly objectionable, and every expedient was tried to get rid of the drawback.

The pink curtain proved of no visible use. The rhodamine-dyed reflectors, referred to by Mr. Beaufort, were more satisfactory, but we found the colour of the reflectors faded; thus their effect was gradually lost.

The most permanent and satisfactory results were achieved by the use of a few ordinary 50 c.p. incandescent electric bulbs, placed at intervals near the mercury tubes.

It may be interesting to mention that this light, on the stand, as originally sold, did not meet with my ideas of good lighting, but, by discarding the stand and reflectors and making a radical rearrangement of the disposition of the tubes, highly successful work resulted, and I recall with pleasure the use of this modified system of mercury-vapour studio lighting.—Yours faithfully, J. SPENCER ADAMSON.

SHORTER HOURS IN THE DARK-ROOM.

To the Editors.

Gentlemen,—I wish to state the case for dark-room assistants as briefly as possible. Dark-room work, at the best of times, is not by any means the most congenial part of photographic work, especially when one is at it for nine or ten hours a day in small stuffy, partly ventilated rooms, as many of them are, as I know too well. The hours of such kind of labour are in many cases far too long. Too much of it, especially in the dingy holes which serve as dark-rooms in many parts of the country, is always detrimental to health. Since leaving the army I have been on my own in photographic work, and practically all our printing is done in matt P.O.P., which is, I consider, very much more satisfactory and gives more artistic pictures than prints on bromide paper. In pre-war days the terrible monotony of dark-room work was very trying, so I plead to all professional photographers throughout the country to consider the question regarding their dark-room assistants, and to reduce the hours to a maximum of seven hours for five days in the week and three and a-half or four for the early closing day. Seven hours a day is plenty long enough for such trying work, and if no time is wasted a considerable quantity of work can be turned out in the course of a day.

I would like to hear further on the matter from photographic employers and employees.—I am, gentlemen, very truly yours,

"Moss Bank" Studio, C. F. WATKINS.
Etchingham, Sussex.

THE HYDROQUINONE-RODINAL DEVELOPER.

To the Editors.

Gentlemen,—Reference is made in your "Answers to Correspondents" of last week (page 79) to the hydroquinone-rodinal developer, a little-known combination which did not merit the approval of many workers. "G. D." is informed that there was no published formulæ for the combination "as far as we know." As a matter of fact some formulæ were published about sixteen years ago, but as the "combining" fever was then at its height, and so many combinations of the many different developers appeared—many of them of little consequence and even less use—the less important of them may have escaped your notice, notebook, index, and memory.

Of the many combinations which have been advocated that of hydroquinone and rodinal appears to have attracted the least attention, at any rate it never earned the approbation of any plate-maker or developer-maker. Pyro-metol and metol-hydroquinone are to-day the sole relics of the once-popular craze of mixing developing agents, although pyro-glycin, adurol-metol, eikonogen-hydroquinone, and metol-glycin tried hard for a place, and certainly managed to find their way into instruction sheets and handbooks—a thing hydroquinone-rodinal never did to my knowledge. The "published" hydroquinone-rodinal formulæ I have in my large collection are from American and German periodicals and the English "Photographic News."

A formula which came from a German source in 1903 stands as follows:—

A.	Soda sulphite	1 oz.
	Hydroquinone	120 gr.
	Citric acid	5 gr.
	Potassium bromide	10 gr.
	Water to	20 oz.
B.	Potassium carbonate	2 oz.
	Water	20 oz.
	Rodinal	1 oz.

To make up a working developer for soft or "portrait" negatives take equal parts of A, B, and water; for strong negatives use equal parts of A and B and no added water. By varying the amounts of the A (hydroquinone) and B (rodinal) solutions one could, the originator of the formula told us, obtain hard, soft, or any other kind of negatives. This was quite all right in theory because of the well-known density- and detail-giving powers of the hydroquinone and rodinal solutions respectively, but in practice the ringing of the changes did not produce with certainty the wonderful results one was led to expect. A combination which came to us

from America in 1905, and one "fathered" by one of the photographic colleges there, is of a different type:—

A.	Hydroquinone	40 gr.
	Soda sulphite	200 gr.
	Rodinal	16 drops.
	Water	4½ oz.
B.	Potassium carbonate	60 gr.
	Water	2 oz.

This, we are told, is really a one-solution developer, because the A solution will work by itself, it containing the two agents. The addition of a few drops of the B solution to each ounce of the normal (A) developer quickens development very considerably, and more or less of B is recommended for hand camera and under-exposures. Indeed the "inventor" of the combination went so far as to advise equal parts of A and B for focal-plane exposures.

In conclusion, I may say that I am sending you the formulæ because they have been asked for, and you may deem it advisable to record them in your pages. I am not sending them because I consider them to be superior to any of the standard hydroquinone-metol formulæ, although some workers have stated them to be so. After making some experiments at the time of the craze for combining developers I came to the conclusion that if rodinal was to be called upon to assist hydroquinone in the work of developing a negative the best plan was to develop partly—for density—with a normal hydroquinone solution, then wash and finish with weak rodinal for details, or to get out the details first with rodinal, wash, and then go for density with a normal hydroquinone developer. But, after all, it is doubtful if the orthodox metol-hydroquinone combination can at the moment be beaten, although a hydroquinone and rodinal or azol mixture has possibilities, and might well claim the attention of experts in these days of "reconstruction."—Yours faithfully,

GODFREY WILSON.

THE ASSISTANT QUESTION.

To the Editors.

Gentlemen,—I have followed with a good deal of interest the correspondence which has been toward with regard to the assistant question, and as an old exponent of the question—I wrote you several letters on the subject some five or six years ago—I should like to record my thanks to your many able correspondents.

At the same time, I would like to ask what is the position of assistants who are not yet released from the Army?

For myself, I am comfortably off just now, but I do not aspire to spend the rest of my life in the service of the Army, so that, if we are to be taken into consideration in getting out the details of the scheme, I should be glad of information.

I need only add that I have had chats with many other assistants and employers both in the Infantry and the R.A.F., and all are agreed that something ought to be done; but, of course, the old apathy of our class has to be taken into consideration, and, so far as I am able to help while in the Army, I am entirely at the service of Mr. Adams and yourselves.

The scheme of exams. which is seriously advocated now is a jolly good idea, and ought to meet with the approval of all qualified men, and in my present capacity of lecturer on photography under the Army Education Scheme I could, perhaps, do something to bring about such exams. for men in the Northern Command; in any case, I may be able to help, if so, and in whatever way desired, please let me know, and I'm on the job. If men could go out of the Army with a certificate of ability it would no doubt help on the cause greatly.

In conclusion, Gentlemen, I wish the good old "Journal" every success in its honest endeavours on our behalf, and a long and prosperous life. It seems to large along, despite all difficulties.—Yours faithfully,

ARCH. J. BACON, Sergt.
(Late Cadet, R.A.F.).

No. 3 Section, Humber Garrison, Winestead Hall, near Hull.
February 9, 1919.

To the Editors.

Gentlemen,—If I may add to my previous letter I should wish to point out to Mr. Houghton where I am not in accord with his suggestions.

In the first instance I do not consider it to be a duty of the P.P.A. to provide or assist in providing training facilities for assistants. That, surely, is an imposition, and opens out too many possibilities for abuse. An employer could take any number of apprentices and the P.P.A. would do the rest. On this point I contend that an employer should train his own apprentices. If he is not competent to do so or neglects that duty, then it should become a matter for a court of law. That point must not be forgotten even if your correspondent is dealing with the older and recognised assistant and his needs. His needs are training and greater efficiency. The responsibility for that lies with the man who should have trained him—the man who encourages inefficiency by employing him, and the man himself for not demanding greater knowledge. But how do we arrive at this fact that assistants are lacking? At present it is a mere hazard of individual deductions. And having arrived at such a conclusion by these unsatisfactory means it is a simple matter to hand over the work of reconstruction to the only body in existence. It is a suggestion which would not stand practical application, and I do not think the P.P.A. will adopt it. I am convinced that if the P.P.A. will formally draft a standard of attainment—a high one and stick to it—that body will have done something far more practical. To do that and to supply information, as stated in my previous letter, is all that is necessary and desirable. As an assistant I do not look to the P.P.A. to complete my training. If a standard is set and I am found lacking, then I can "swat" and become efficient, as men do in other professions. But I do claim the right to know what I am supposed to possess in the matter of skill. Obviously, until that information is forthcoming any assistant doing responsible work can claim to be a qualified assistant.

Dealing with the question of certificates I consider references for daily work given on official forms based, on the fixed standard of attainment, would be more practical for ordinary use. A short examination is not a criterion of a man's capabilities. If at any time after becoming a recognised skilled worker an assistant wishes to qualify for a manager or a head of department, examinations could be arranged and certificates given. Those examinations should be thorough, and anyone holding such a certificate should be recognised as possessing a very high degree of knowledge and skill.

To make membership of the P.P.A. conditional would answer no purpose at all. Assistants are not anxious to become certificated members of the P.P.A. Assistants I believe are quite as anxious to get to the bottom of all things photographic as are employers. And it can only be possible to come to a satisfactory solution of the whole matter by getting to know what each other is thinking and going to do about it.

Primarily we have to consider the status of photography as a profession. That subject immediately unfolds into two aspects; the employer's and the assistant's. Those two aspects give rise to two solutions; antagonism or fusion. I plump for the latter; hence I suggest that the P.P.A. be open to all photographers.

This point is I believe the main issue in this correspondence. The challenge of inefficiency has crept in. I do not deny its truth. But it is a direct challenge to assistants, who I hope will take it up. And I hope, too, employers mean that they do wish for more efficient assistants.

Regarding the whole matter as a serious proposition, I think the amalgamation of ideas in one association is most important. For whatever the claims of employer or assistant may be, they are all useless, unless by united effort photography as a profession is lifted high and held there.—Yours truly,

ROWLAND SAMMES.

Reigate.

THE LATE LIEUTENANT C. F. LAN DAVIS.—We notice in the brief particulars of the will of the late Lieutenant Cyril Frederick Lan-Davis, which have been published in the daily papers, that the estate of the deceased gentleman amounted to over £18,000. Of this £5,000 was left in trust for pensions to persons now or formerly in the employment of Messrs. J. H. Dallmeyer, Ltd., of which Mr. Lan-Davis was a director.

THE PHOTO-MICROGRAPHIC SOCIETY.—The next ordinary meeting will be held on Wednesday, February 26, at 7 p.m., at King's College Bacteriological Laboratories, 62, Chandos Street, W.C., when Dr. B. P. Haigh will lecture on "The Internal Structure of Metals." Visitors are invited, and cards of invitation may be obtained on application to the Hon. Secretary, J. G. Bradbury, 1, Hogarth Hill, Finchley Road, Hendon, London, N.W.4.

Answers to Correspondents.

SPECIAL NOTICE.

In consequence of general reduced supplies of paper, as the result of prohibition of the importation of much wood pulp and grass, a smaller space will be available until further notice for replies to correspondents.

Moreover, we will answer by post if stamped and addressed envelope is enclosed for reply: 5-cent. International Coupon, from readers abroad.

The full questions and answers will be printed only in the case of inquiries of general interest.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

E. A.—The Manchester College of Technology, Sackville Street, Manchester.

J. S.—The Order in regard to the opening of new businesses has not, so far as we know, yet been revoked, and although, perhaps, not always strictly enforced, it would be as well for you to make application for a permit to the Director of National Service, South Road, Nottingham.

F. W.—We have never heard of carbon printing being done by acetylene light, and we should say that the number of lamps required would produce an amount of heat which would make printing impossible. The only artificial lights, in our experience, for carbon printing are mercury-vapour and the enclosed arc.

S. B.—The glass should, if possible, be at least 18 inches wide and on as long strips as possible; if you can get it in three pieces for the 8 ft. it will do very well. Rolled plate is the strongest and best. The top light should come about half-way up the roof if you want to do groups; 6 ft. will do for single figures. We assume the background will be at the door end, for at the other end the window is awkwardly placed.

G. T.—The two lenses are evidently both *f*/3. The marking with *f*/ values is comparatively modern, and the older lenses were marked 1, 2, 3, 4, etc., with no reference to the focal value. Therefore we should say the C. and G. lens was dear compared with the Ross. You do not give the aperture of the 10 in. Ross lens at £5. If anything near *f*/4 it should be a bargain. In portrait lenses Ross and Dallmeyer are about equal in value for similar sizes.

A. G.—Any coal-tar dye "soluble in spirit" would answer your purpose, but, so far as we know, nothing has been done in ready-made mixtures to match wood. Moreover, many of the dyes will not stand exposure to strong light. We have found Stephen's stains the most satisfactory for the purpose, and if you are careful they should not warp the frames. If you want to try the dyes, write to Messrs. Lindsay and Co., chemists, Leather Lane, London, E.C.

G. P.—For large heads, ten or twelve inches is still rather a short focal length: fourteen or sixteen inches is better. An R.R. is quite a suitable type of lens where, as in your circumstances, there is plenty of light. The Instantograph camera is one of a very light build, and in the half-plate size certainly not suitable for carrying a lens of even 10 or 12 inches focus. If we were you, we should buy an old pattern, long-focus camera, such as you can get for a pound or two from a second-hand dealer.

C. B.—A reliable firm for such of the photographs as are likely to be taken by the newspapers is the Press Photographic Agency, 170, Fleet Street, E.C. As regards the photographs of children and other subjects which are not of topical interest, the most likely purchasers are the publishers of postcards, of whom the largest buyer is the Rotary Photographic Company, West Drayton, Middlesex. But they buy only, as a rule, in sets of six, and therefore, in order to make it possible for them to offer, you would need to arrange the subjects on this basis. Perhaps the Press Photographic Agency would be able to look after this business also for you among firms who issue calendars and the like.

J. H.—We are quite in accordance with your idea that better quality may be obtained by using reflected light in enlarging than by using direct light through a condenser. The only difficulty is the length of exposure when working from dense negatives, and, in fact, the almost impossibility of getting through the high-lights of a very yellow one. The Boardman pattern is quite a typical one, and should answer well for average negatives. At the same time, we think you might do well to inquire as to the new Cooper Hewitt Gridiron lamp. This is very much used in the United States, and some of the large firms here are trying it. Address your inquiry to the Westinghouse Cooper Hewitt Company, 80, York Road, King's Cross, N. With regard to general fittings, we can only think of one piece of advice which may be useful, and that is to have plenty of sink room. You can easily cover it when not wanted, and when you have a big job it is there. Of course, you will instal your copying camera on a proper table with runners, an adjustable easel and lights on both sides; half-watts will do splendidly for these. For developing light use two thicknesses of golden fabric and have plenty of light area.

FORTHCOMING EXHIBITIONS.

February 10 to 22.—Glasgow and West of Scotland Amateur Photographic Association Inter-Club Exhibition. Secretary, Gilbert S. McVean, 125, West Regent Street, Glasgow.

February 20 to 22.—Leicester and Leicestershire Photographic Society. Secretary, H. C. Cross, 80, Harrow Road, Leicester.

February 22 to March 8.—Edinburgh Photographic Society. Entries close February 13. Secretary, George Massie, 10, Hart Street, Edinburgh.

April 17 to May 22.—Hammersmith Hampshire House Photographic Society Annual Exhibition. Two open classes. Entries close March 13. Joint secretaries, J. G. Abrahams, 41, Hamilton Terrace, London, N.W.8; A. H. Page, 12, Lime Grove, London, W.12.

EASTMAN KODAK COMPANY.—The directors have declared the following extra dividends:—2½ per cent. upon the common stock, payable on April 1 to stockholders of record on February 28; 5 per cent. upon the common stock, payable on May 1 to stockholders of record on March 31. The ordinary quarterly dividends of 2½ per cent. upon the outstanding common stock, and 1½ per cent. upon the outstanding preferred stock will be paid as usual on April 1 to stockholders of record on February 28.

The British Journal of Photography.

The Oldest Photographic Journal in the World.

PUBLISHED EVERY FRIDAY. ESTABLISHED 1854. **PRICE TWOPENCE**

TERMS OF SUBSCRIPTION, POST FREE.

UNITED KINGDOM.—One Year, 10s. 10d.; Six Months, 5s. 5d Three Months, 2s. 9d.

CANADA ... ... AUSTRALIA ... ... NEW ZEALAND ... ... SOUTH AFRICA ... ... UNITED STATES OF AMERICA SOUTH AMERICA ... ... INDIA AND FAR EAST ... ... CONTINENT OF EUROPE ...	*One Year.* Thirteen shillings (13s.), or 3 dollars 17 cents, or 16 francs 38 cents, or 6 roubles 15 copecks, or 9 rupees 12 annas, or 6 yens 30 sens.
FEDERATED MALAY STATES, BORNEO AND SARAWAK	5 dollars 57 cents.

HENRY GREENWOOD & CO., LTD., Proprietors and Publishers, 24, Wellington Street, London, W.C.2.

IMPORTANT NOTICE TO READERS.—Until further notice agents will supply the "B. J." to order only, as the acceptance of "returns" by a publisher is now prohibited by the Government. It is therefore necessary in order to ensure the regular delivery of the "B. J." each week to place an order definitely with a dealer, newsagent or bookstall clerk, or to send a subscription to the publishers.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3069. Vol. LXVI. FRIDAY, FEBRUARY 28, 1919. Price Twopence.

Contents.

	Page
Ex-Cathedra	93
Lenses for Odd Jobs	94
Practicus in the Studio. By Practicus	95
Chemical Fog. By J. I. Crabtree	97
The Value of Expression in Portraiture. By W. E. Debenham	100
The Professional Photographers' Association	100
The British Industries Fair	101
Assistants' Notes	102
Patent News	103
Meetings of Societies	104
Commercial and Legal Intelligence	105
News and Notes	105
Forthcoming Exhibitions	106
Correspondence—	
Aerial Cameras—Avoiding Developer Poisoning—The Word "Bioscope."	106
Answers to Correspondents	107

SUMMARY.

The various considerations which are of the utmost importance in choosing a site for the studio are the subject of the article this week by "Practicus." It is shown, by a number of instances, that difficulties in the site may be overcome and without great sacrifice in the efficiency of the studio. (P. 95.)

An article in the "American Annual of Photography" by Mr. J. I. Crabtree, of the Eastman Research Laboratory, deals in a very comprehensive way with the many causes of chemical fog. The effect of minute impurities in the developing solution and of the manner of compounding the developer are particularly worthy of notice, since they are the least likely to be detected (P. 97.)

In a leading article, we point out the commercial value of an equipment of lenses sufficiently varied for exceptional occasions. The usefulness of a lens of extremely wide angle and, on the other hand, of one of the telephoto type is perhaps not so widely realised by the professional as by the amateur. (P. 94.)

Some hints on the obtaining of expression in the sitter at the time of exposure are contained in some brief notes by Mr W. E. Debenham. (P. 100.)

The report of the Professional Photographers' Association to be presented at the forthcoming annual meeting records a membership last year of 915, and deals with other matters which have engaged the attention of the Association. (P. 100.)

A considerable number of exhibits related to the photographic trade are to be found in the British Industries Fair now being held in the Pennington Street premises of the London Dock and remaining open until March 7 next. (P. 101.)

Some practical hints on the celluloid facing of prints are contained in an "Assistants' Note" on page 102.

In the design of field cameras, makers show a tendency to cut things too fine in the way of making the bellows large enough to avoid cut-off when the lens front is placed in an exceptional position. (P. 94.)

The making of a stock solution of a single chemical is more conveniently done, and the solution is likewise more convenient in use, if the strength of the solution be appreciably less than saturated. We instance the usefulness of this method in a paragraph on page 93.

The commercial photography of flowers, for which there is a demand among growers and seed firms, is largely a question of recognising the "points" which a bloom possesses and giving due emphasis to these latter in the photograph. (P. 94.)

EX-CATHEDRA.

Phase and Change. While much is being talked of reconstruction on the grand scale, in the comparatively small field of photography we see things changing as the inevitable result of the circumstances of the time. The balance between the supply of and demand for labour—if that can be called a balance which a few months ago showed the latter to be immensely in excess of the former—has been disturbed, and signs are plainly discernible of a reversion to the pre-war conditions under which the supply, or, at any rate, the publicly offered supply, was greater than the demand. It is easy to understand that the progress of demobilisation in conjunction with the new labour which has been recruited during the war should tend towards this condition in the ranks of photographic assistants. And the same thing is observable in respect to the firms or individuals who cater for photographers' trade work. Such who have come into existence during the war now find themselves in competition with the demobilised ones who formerly had their established circle of customers, and are now taking active steps to recover their business. The circumstance provides a caution to those who may be thinking of purchasing a war-created business of this kind. A connection is difficultly held, and from several motives customers will be likely to return to those who previously had their patronage. The difficulties of supply, and, in many cases, the lower quality of work during the war period are factors which will operate in the direction of restoring custom to those who previously had it, and for this reason a business which is no more than two or three years old becomes a somewhat speculative proposition.

* * *

Strong v. Saturated Solutions. The keeping of certain chemicals in saturated solutions is a recommendation which comes from the old days of photography, when workers had a nodding acquaintance with practical chemical operations. At the present time, when such knowledge is the possession of a very small minority, the practice may lead to a degree of error which may not be suspected by the individual worker. Few will take the trouble to test the temperature of a saturated solution or to make certain that it is saturated at that temperature. And even if that is done, an awkward calculation is necessary in order to discover the quantity of solid chemical which a given volume of the solution represents. On these accounts it is a much better plan, we think, to sacrifice a measure of the concentration afforded by a saturated solution and to obtain in exchange the certainty of constant strength and the convenience of translating from solution to solid. To put this idea into a concrete shape, a saturated solution of hypo is one which varies greatly in strength according to the temperature, and at any given tempera-

ture represents per unit volume an odd weight of the chemical. A much more satisfactory and convenient plan of keeping hypo in concentrated solution is to dissolve the crystals in water and make up to a volume corresponding with twice the weight—for example, 1 lb. of hypo dissolved in water to form a total bulk of 32 ozs. One ounce of hypo is then contained in every two ounces of the solution and the making up of fixing baths of any required strength becomes the simplest of arithmetical calculations. The same plan may be adopted for less soluble substances, choosing a ratio of 1:3 or 1:4 in place of the 1:2 which is possible only for such extremely soluble substances as hypo, potassium carbonate, and a few others.

* * *

Commercial Flower Photography One of the most difficult branches of commercial photography is the portrayal of flowers, fruit, or vegetables for catalogue illustration, yet it is work that is frequently in demand. A good knowledge of florists, flowers and horticulture generally will go far to helping the operator in emphasising just those points that the grower or advertiser wishes to put forward to his public. Perhaps our meaning may be the more plain if we give a simple illustration, taking the case of that popular flower the sweet pea, one, which it may be added is constantly being improved by various growers who are rapidly coming to see that one of the most direct, simple and effective methods of advertising the value of their new varieties and bringing their good points before flower-loving connoisseurs is a good photograph of a perfect bloom. Among the points looked for in the perfect sweet pea are the number of flowers that can be grown upon a single stem, their spacing upon the stalk, the length of the latter, a most important point, the size of the individual blossoms, and in connection with this an absence of what is technically termed "coarseness," and lastly the colour of the flowers. If a photograph of a perfect bloom selected at some trouble by a fastidious grower is to be a success then it will have to be something more than an ordinary hit or miss photograph of the bloom, and it will need to be arranged so that the points of the flower are shown to their best advantage. Thus the adjustment of the bloom in its holder or vase is important, likewise the position from which the picture is taken, and the rendering of its texture. In the case of vases of flowers, much the same rules will have to be followed as in the case of single specimens: nothing in the way of a "bunchy" arrangement is to be permitted. Backgrounds are best made of large sheets of mounting card of various colours, and these may also be employed for growing plants out of doors in isolating the subject from its background. Upon the technical side little need be said. An ordinary field outfit having long extension and a good lens of fairly long focus is as good an equipment as can be desired, since, except in the case of flowers growing outside, speed is not of importance. Of course, panchromatic plates and a set of screens are to be regarded as absolutely essential in order to secure correct colour rendering. A thin negative having abundant detail is best, those obtained by the tank method being highly satisfactory. It is becoming realised that a photograph is more satisfactory than one of the best drawings; colour photography is likely to popularise this branch still further, and commercial photographers should take full advantage of the demand.

* * *

Field Camera Bellows. The modern field camera is looked upon, and justifiably so, as an instrument of precision, and in many ways it is difficult to see how the standard design can be improved. There is one point, however, that is frequently overlooked by designers, and that is the importance of fitting their instruments with bellows of sufficient width. Not only do wide bellows avoid trouble due to reflected light from their inner folds, but also it is next to impossible when using wide angle lenses of short focus to avoid some "cut off" of the image on the plate by the edges of the bellows, particularly when these are made to give a long extension. This form of trouble is the more likely to be met with in the conical bellows form than when the instrument has parallel bellows. For the latter type we must confess we have a preference, but even when conical bellows are in use there is no reason why the maker should not fit them of sufficient size to prevent the trouble referred to. Some cameras that we have seen leave much to be desired in the size of their bellows, and we can call to mind one of our own instruments that could never be used with success for wide angle work for this reason. Such a fault in an otherwise excellent design is spoiling the ship for ha'porth o' tar. When the bellows are made for long extension there is often a tendency for them to "cut off" part of the image when used at a shorter extension, and for this a loop of elastic is sometimes fitted to the top of the bellows in order to draw away the extra folds from the line of rays thrown by the lens. We have found in practice that this plan is not very satisfactory, and have supplemented the loop with two more, one at each side, which are attached to the nuts holding the swing front. In this way the extraneous folds are drawn entirely out of the way. When old bellows are inclined to sag in the middle at a long extension, a couple of loops of extra length attached in the same way will go far to overcome the trouble.

LENSES FOR ODD JOBS.

Most professional photographers would be surprised if they were told that in the matter of lens equipment they were far behind many enthusiastic amateurs, but we believe that we are correct in making this assertion. The fact is, that the professional is rather apt to put all his eggs into one basket, or, in other words, to invest in a few first-rate lenses and to consider that he has done all that is needed. He selects lenses for the size of the plate he generally works, and, so far as it goes, this is quite correct; but he seldom has anything to fall back upon for any job which may require one of a different focal length. It is remarkable that this is more likely to be the case with the photographer of to-day than it was a quarter of a century ago. Then it was not uncommon to find an equipment of a complete set of portable symmetricals, twelve in number, ranging from three to twenty-one inches in focal length, the first ten fitting the same flange and in many cases having the lens cells interchangeable, so that even a variation of half an inch in focal length could be obtained. There were also "casket" sets, usually not of the finest optical quality, but good enough when used with small apertures, which gave an even greater range at a very reasonable cost.

The portrait man does not, of course, need such a variety of tools, but the man who is willing to take on any class of work frequently finds that he cannot do exactly as he wishes, and, what is more important, what his client wishes, because of his imperfect equipment. This state of things can easily be remedied at quite a small cost if it be borne in mind that a comparatively poor lens works nearly as well as an expensive one if it be possible to use a small aperture. Another point to be remembered is that with modern enlarging methods at our command it is not always necessary to limit ourselves to one particular size of plate, since, if we can get our subjects, it is easy to make prints of a larger or smaller size as may be required.

Let us take a few examples of possible orders and how they may be executed, or, to be more precise, how such

orders have been executed. An extremely wide angle view of a street scene was required to show the disadvantages which would result to a shopkeeper if a railway viaduct were put near his premises. No orthodox lens would give the necessary view angle, but by using a four-inch lens which happened to be at hand, a negative was made upon a whole plate, which did just what was wanted: it gave the width of the picture well defined, and when the top corners were blocked out a 15 × 12 enlargement was made which did good service in court. Now, how many photographers have a decent four-inch wide angle lens in stock? Yet it is not an expensive tool, and if not paid for by the one job, its possession helps to build up a reputation for efficiency which leads to future orders. Such a lens is not only useful for outdoor work, but for enlarging when only a moderate length of bellows is available. If it be necessary to take a small head out of a group, a considerable degree of enlargement can be obtained directly instead of having to resort to a second enlarging process. Conversely, such a small lens is of great value for making reductions with the enlarging lantern. If a copy, say, an inch by three-quarters, or less, has to be made from a cabinet negative it is easy to do so.

Going to the other end of the scale it is a rare thing to find a telephoto lens in the hands of the ordinary photographer; yet it is a most useful instrument for many purposes besides taking distant views. We remember some years ago, when the original Adon was introduced, being told by a large firm who specialised in catalogue work that they had been recommended by an amateur to try a telephoto lens for the photography of small articles, with the result that they had greatly improved the perspective in every case to the satisfaction of their customers and their own profit.

While comparatively cheap lenses of the old rectilinear construction are capable of doing much useful work, we should not recommend their purchase if funds permit of more modern instruments being obtained, for when a lens is being used for copying or in the enlarging lantern at an extension which is many times its focal length, a large aperture is of great advantage, the difference in luminosity between one having an initial aperture of $f/6$ and $f/16$ being very noticeable, and if such lenses are of the "convertible" type, giving two or three focal lengths, their utility will be increased. Still, before purchasing new lenses it is as well to take stock of what lenses are on hand, and to make a note of their focal lengths. If duplicates of any one size are found one should be sold or exchanged, so as to secure further variety.

It may be found that although suitable lenses are available, there is no means of using them upon large cameras or enlarging lanterns, and it is therefore advisable to have them adapted to the flanges already upon such cameras. This can be done at the cost of a very few shillings, and in the case of modern instruments it is not necessary to part with the lens or large flange, as these will be of standard size, and it will only be necessary to mention the diameter. For a makeshift, a very good plan is to cut a hole in a piece of card so that the lens thread will just go through, securing it by screwing on the flange at the back, the card being attached to the camera front by means of four drawing pins.

Supplementary lenses of the Planiscope type will often prove useful, to shorten the focal length of lenses which will not give the desired angle or magnification, but it will usually be found necessary to work at a very small aperture when these are used, as the corrections of the original lens are upset. However, for this class of work speed is usually not necessary. A makeshift Planiscope may be made by attaching an ordinary small single lens, such as the front of a small portrait lens or one of the combinations of a rapid rectilinear, by means of a cardboard ring. This sound rather crude, but we have known it to be done with success.

PRACTICUS IN THE STUDIO.

[Previous articles of this series, in which the aim of the writer is to communicate items of a long experience in studio portraiture, have appeared weekly since the beginning of the present year. It is not thought possible to continue the series to the length of that by the same writer which ran through the "British Journal" some years ago, but if any reader among the younger generation of photographers, and particularly those engaged as assistants, has a particular subject which might be dealt with, his or her suggestion will be welcomed. The subjects of the previous articles of the series have been as follows:—

A Talk About Lighting (Jan. 3).
The Camera and the Lens (Jan. 10).
Managing the Sitter (Jan. 24).
Backgrounds (Jan. 24).
Studio Exposures (Jan. 31).
Artificial Lighting (Feb. 7).
Printing Processes for Portraiture (Feb. 14).
Studio Accessories and Furniture (Feb. 21).

THE SURROUNDINGS OF THE STUDIO.

Some writers on lighting in the studio have treated the matter as if all studios were alike, and that a set of rules, which should ensure any desired result if they were followed, could be evolved. There could be no greater error, for hardly any two studios are exactly alike; in fact, so great is the difference that an operator who has created quite a reputation for artistic work in one will fail dismally in another. It has been my luck to work in many oddly constructed places, but I have hardly found one where, with a little study and perseverance, decent results could not be obtained, the principal difference being not so much in the appearance of the negatives as in the length of exposure necessary to obtain them. This, I hope, will be of some comfort to those who have found an otherwise eligible position for a studio, but are doubtful as to its possibilities in the way of lighting.

There are two main points to be considered, one being the orientation of the building, or its relation to the cardinal points of the compass, and consequently to the sun, and the other the presence of outside obstructions in the shape of walls, trees, or other objects. Regarding the first, I think that too much stress has been laid upon the necessity for a northern aspect for the glass side; in fact, I have known cases where a photographer has gone to great trouble and expense to secure this or even to reject a position where it could not be obtained. For instance, where it has been a choice between securing a good working length with an eastern aspect or too short a studio for good work, the latter has been chosen, simply from fear of not being able to control

the light in the former position. This idea dates back to wet-collodion days, when it was considered essential to have a large amount of open light, and has been handed down from one writer to another, although we must not forget that even in those early days Mr. Valentine Blanchard, whose artistic ability has never been questioned, proved that the finest possible work could be done all the year round in a studio facing due south. I frequently work in a studio with a full western aspect, and find no difficulty in doing so, although I must confess that I should like it much better if it were a northern one. The reason for this is, of course, that in the latter one can get the same effect all day without altering the blinds, while in the former modifications are necessary as the light works round.

To make the best of a studio so situated that the sun shines upon the glass, it is necessary to be able to cover the whole of the light either with dark or white blinds or curtains as may be needed, but when I say white blinds I do not mean pea-soup colour, which is the normal tint in many studios. These intercept so much light that they are useless as diffusers, which is their real mission. Mr. Blanchard screened his sunlit roof and side with light frames, upon which tissue paper was stretched; but I prefer my favourite white nainsook festoon curtains, as they may be easily pushed aside when not required, and are, moreover, easily washed when soiled. I have worked in a studio glazed with ground glass, but found that there was too much glare, and when white blinds were used in addition the exposures were too long. It is almost needless to say that in a sunlit studio there must be no bare glass, the white blinds being the source of light, when they act much in the same way as if a sky covered with white clouds were seen through clear glass. The simile is, perhaps, not quite good, but that is as nearly as I can put it. In such a studio the inside walls must be rather dark or flatness will result, and the area of white blind used must be no larger than is necessary. If we consider the ease with which good results can be obtained with a single enclosed arc lamp we shall see that a very large area of light is not necessary.

The second point, that of outside obstructions, is a more difficult one, and every individual case must be dealt with as a special problem. During the past few weeks I have had to deal with two cases in which the trouble arose from the proximity of a high wall a few feet from the side light. In the worst one the wall was higher than the studio, and about nine feet away. It was of dark brick, and how the previous occupant of the studio, for whom it was built, managed I cannot imagine. His work was certainly unorthodox, and he abandoned photography for the stage. Then during an interval it was occupied as a workshop, until its excellent business position attracted another photographer who decided to take the chance. The first thing to be done was to visit the owner of the wall and to ask his permission to have it painted white; this he gave readily enough, and the next to stipple the side light halfway up with very thin zinc white paint. The necessary dark and white blinds were fitted, and even in this dull weather the results obtained are excellent, although, of course, the exposures are not quite as rapid as they would be in a more open position.

Another studio was even in a worse situation, being located at the bottom of a deep well-hole surrounded by lofty houses. Before it was built I went on to the leads on which it was to stand, and certainly felt some misgivings; still it was there or nowhere, and as the prospective user was a wealthy man we decided to take the risk. There was toplight, and not too much of that, but, with the help of outside silvered reflectors, the lighting was quite passable, and many excellent portraits were taken in it. All cases are not so bad as this, but there are often obstructions which seriously reduce the value of a studio. Once I built a studio in a garden in the winter, and it was very satisfactory, but what a difference when the leaves came on the trees again! Fortunately, most were on my own ground, and were drastically lopped, and my next-door neighbour helped, by cutting in one or two which still troubled me. It is wonderful what you can get done if you talk nicely to people. Here, again, I found that stippling the side light was an improvement, as light which would be nearly vertical is intercepted and dispersed in all directions. If rolled plate be used in such circumstances, there is a great gain in light if the ribs be placed horizontally in the side light; every rib becomes a little cylindrical lens, and throws light into the studio.

In the case of an immovable obstruction which is very near the proposed studio, it is advisable if possible to raise the building, so that it will overlook the obstacle. A friend who found himself in this difficulty said afterwards that it proved a blessing in disguise, for he had to provide himself with an excellent workroom upon which the glasshouse was built, and he found this much more comfortable than the cramped quarters he had proposed using, and the extra cost was not great considering the value of the accommodation provided.

When building or adapting a studio care should be taken to avoid minor obstructions caused by portions of the building itself; for example, I have seen a single slant studio in which the slant was obtained by throwing back the top behind the general line of the building, thus leaving a triangular piece of wall standing out at each end. This may not be serious in many cases, but if a front lighting is wanted it considerably curtails it, and this is more especially so when the studio is rather a short one, as the angle of light is then necessarily more acute.

Great caution must be exercised in erecting a studio near vacant land, as there is no guarantee that another building will not be erected that will shut the light completely out. In order to secure the right to do this, a landowner will often erect a screen on poles so as to block any window on neighbouring land in order to prevent any subsequent claim to "ancient lights."

It is easy to realise that different situations call for differently designed studios. In the commonest case of difficulty, where there is top light only, it is desirable to have as long a range of glass in the roof as possible, as we can then draw the blinds well over the sitter's head, turn him slightly away from the light, and get the effect of a high side light; such a studio should be built as wide as possible for this reason.

Studios of moderate height with side light only do not, perhaps, come within our scope, but as they, in common with those with top light only, are capable of being improved by the addition of a supplementary artificial light, we mention them. A top light may easily be produced under an opaque ceiling by using either the half-watt or an enclosed arc lamp in a metal reflector, which gives a strong though soft reflected light from the ceiling, while similar lamps may be used either to illuminate a white side wall or to give a direct side light through a diffuser. The mixture of lights is not at all objectionable, and, in fact, will hardly be noticed by many sitters.

Difficulties in lighting will be minimised if the studio be wide enough to allow of considerable latitude in the placing of the sitter; it should be possible to work diagonally or even quite across the studio, and it should always be arranged, if possible, that either end of the studio can be used.

When inspecting an empty studio or the site for building one, a very simple way of judging of its possibilities is to seat oneself in the position likely to be occupied by the sitter, and from there to note how much clear sky is visible, and the nature of any obstructions. This gives a good starting-point, and is better than attempting to judge the lighting, at all events, in the open air.

PRACTICUS.

CHEMICAL FOG.

(A Paper from the "American Annual of Photography, 1919.")

If the sensitive emulsion with which a photographic plate is coated is examined under a high-power microscope, it is seen to consist of fine crystals of silver halide (chloride, bromide, iodide, etc., or complexes of these) embedded in gelatine. When light is allowed to fall upon these crystals they are affected in such a way that they are capable of being converted into metallic silver by certain chemical solutions known as developers, while the crystals not exposed to light remain unaffected. The process of converting the silver halide to metallic silver is called in chemical terms reduction, and the developer is called the reducing agent.

All reducing agents, however, are not developers. An alkaline solution of stannous chloride will reduce unexposed silver bromide, while a reducing agent like sulphurous acid does not affect it at all. Developers therefore lie between these two extremes, an ideal developer being one which completely develops all the exposed but does not begin to develop the unexposed crystals in the emulsion.

Most developers fall short of this ideal condition and develop a small proportion of the unexposed emulsion, producing a uniform veil or layer of silver over the entire plate which has the effect of obliterating fine shadow detail and diminishing the contrast. This fog produced by undesirable chemical action is known as "chemical fog," and it may be measured in terms of "density" in the same way as the silver image.

The amount of chemical fog produced in any particular instance depends on the following factors:—

I.—The Nature of the Emulsion.

A. The Type of Emulsion.—Photographic emulsions may be divided broadly into the following classes:

High and low speed negative emulsions.

High and low speed positive emulsions (lantern slides).

High and low speed paper emulsions (bromide and gas-light).

Chemical fog occurs most frequently during the development of high-speed negative emulsions, because in view of their highly sensitive nature and the infinitesimal amount of light-action required to render the silver halide developable, if the developer is too energetic or not compounded correctly it will develop the unexposed crystals also.

Low speed emulsions usually give images free from chemical fog providing a suitably restrained developer is employed. Though it is somewhat of an anomaly that some developers will give clean images on high speed emulsions but will fog a slow emulsion like that on a lantern slide or positive motion picture film. It is therefore desirable in all cases to adopt the developer to the emulsion.

B. The Age of the Emulsion.—On keeping, all sensitive photographic emulsions become more or less fogged, the rate of formation of the fog being hastened by heat and the presence of moisture. Precisely what change takes place when the silver halide crystals are changed from the non-developable to the developable condition is not known. A large number of theories have been propounded, though these cannot be confirmed without further experimental investigation.

C. The Previous History of the Emulsion.—A new emulsion will give fog immediately if it is exposed to certain chemical agents, such as coal gas, sulphuretted hydrogen, or the vapours from benzol, turpentine, etc. The amount of fog produced depends on the concentration of the various chemical agents, the temperature, and the time of action. It is important therefore to store all photographic plates and paper in a cool, dry, well ventilated place.

II.—The Nature of the Developer.

Fog caused by the developer is known as "developer fog." A developer usually contains four ingredients as follows:—

(*a*) The developing agent (pyro, etc.);
(*b*) The accelerator (sodium carbonate, etc.);
(*c*) The preservative (sodium sulphite, etc.);
(*d*) The restrainer (potassium bromide, etc.).

The amount of chemical fog (ignoring the presence of impurities) produced by a developer on any given emulsion depends on the proportion of each ingredient present, that is, on the particular developing formula employed. Considering each ingredient individually:

(A) The common developing agents, elon, hydroquinone, pyro and paraminophenol (Kodelon) in actual practice appear to differ in their fogging power, elon and hydroquinone having a greater propensity for fog than the other two, though so far as our present knowledge goes there is little difference in the fogging power of the pure developers. The apparent differences are due either to impurities or to oxidation products of the developer formed either before or during development.

The oxidation products of paraminophenol (Kodelon) produce very little fogging action even at high temperatures, and advantage may be taken of the fact when developing under tropical conditions. (See "British Journal," 1917, p. 555.)

The limiting proportion of the developing agent to be used in any formula can only be found by trial, though this does not usually exceed 10 grams per litre for economical reasons. Increase in the proportion of elon beyond this usually gives fog, though in the case of hydroquinone an increase in the proportion may prevent fog. The following formula will give extreme contrast on a positive emulsion without fog when used for reel development, whereas a reduction of the proportion of hydroquinone to, say, 5 grams would give fog before any great contrast was obtained.

Hydroquinone	25	g.
Sodium sulphite (desiccated)	33	g.
Sodium bisulphite	3.3	g.
Sodium carbonate (desiccated)	66	g.
Potassium bromide	1.5	g.
Water to	1000	cc.

(B) The accelerator, in the form of carbonates or hydroxides of lithium, sodium, potassium, or ammonium, is added to accelerate the developing action of the developing agent. If too much is added, the developer passes from a true developer to a fogging agent, that is, its reducing power is so great that the unexposed portions of the emulsion are reduced to metallic silver also. The correct proportion of accelerator to be added in any case can only be found by trial. Amidol does not require the addition of an alkali, while in the case of hydroquinone, if sufficient sulphite is present, the proportion of sodium carbonate in many cases may be increased from 25 to 100 grams per litre, without increasing the amount of fog produced.

C. Sulphite, in the form of sodium sulphite, bisulphite, or potassium metabisulphite, is added to prevent oxidation of the developer by the oxygen present in the air, which would otherwise cause oxidation fog. The proportion necessary to prevent undue oxidation is usually equivalent to 50 grams of sodium sulphite per litre, though if sulphite is added in considerable excess of this sulphite fog is produced.

The nature of sulphite fog has been carefully investigated by Mees and Piper ("Phot. Journal," 1911, p. 226, 1912, p. 221), who found that silver bromide is appreciably soluble in

sodium sulphite, so that sulphite fog is caused by the reduction to metallic silver of the silver salt dissolved away from the emulsion by the sulphite in the developer.

The proportion of sulphite used determines the keeping qualities of the developer, but if an excess is employed more or less bromide must be added to compensate for the sulphite fog otherwise produced.

D. The restrainer in the form of sodium or potassium bromide or iodide is added to the developer when mixed in order to prevent chemical fog. In cases of known over-exposure bromide is of course added, though when mixing the developer only sufficient bromide should be added to compensate for any impurities or slight fogging tendency of the developer used.

III.—Impurities in the Developer.

Impurities in the developer are the chief cause of development fog and they may be divided roughly into two classes as follows.—

A. Oxidation Products Formed During Development.—During development several oxidation processes are going on, (1) the developing agent is being oxidised by the air, and (2) the developing agent is being used up by virtue of its reducing action in changing the exposed silver salt to metallic silver. In so doing it is oxidised itself, the product formed being usually identical with that produced by aerial oxidation. The oxidation products formed in this way usually exert a powerful fogging action, especially in the case of metol and hydroquinone. The oxidation product of pyro, which is present when the pyro developer turns brown, exerts little or no fogging action except when present in strong solution.

A third oxidation process taking place is "sulphite oxidation" or the formation of sodium sulphate together with hydroquinone mono and disulphonates. (*Zeit. Wiss. Phot.*, 1913, p. 289). Sodium sulphate is not a fogging agent, while hydroquinone disulphonate exerts a protective action on the oxidation of hydroquinone (loc. cit.), so that the sulphite (if not present in excess) affects the fog produced only indirectly according to its protective action on the developing agents.

The reason why sulphite protects a developing agent from aerial oxidation is not known, it being generally supposed that the affinity between oxygen and sulphite is greater than that between oxygen and the developing agent. The life of a developer before it gives excessive fog depends on so many factors, such as the catalytic and anticatalytic action of the oxidation products of the developing agent and sulphite, that it is difficult to differentiate between the various effects.

It has been observed, however, that the rate of formation of fog varies in proportion with the rate of oxidation of the sulphite. Thus a small trace of copper will accelerate the rate of oxidation of a sulphite solution and produce fog in a developer, while the rate of oxidation of a pure sulphite solution decreases as the concentration increases. Taking advantage of this fact a developer formula suitable for developing motion picture positive film by the reel method (which gives fog with the common developers except glycin) was worked out by the author of this paper as follows:

The method of procedure was to fasten the film on the periphery of a small metal reel and to rotate this while dipping into a tray of the developer maintained at a constant temperature.

The following formula was taken as a working basis, and the proportion of the constituents A and B varied as follows:—

Elon	.5	gram
Hydroquinone	10	,,
Potassium bromide	3.5	,,
Sodium sulphite (desiccated)	A	,,
Sodium carbonate (desiccated	B	,,
Water to	1000	ccs.

Effect of Varying the Sulphite Content.—While B was maintained constant and equal to 100 grams, A was varied as follows:—

Time for Fog on Cine Positive at 80° F.

A 25 grams	3	mins.
50 ,,	3½	,,
75 ,,	5	,,
100 ,,	6	,,
125 ,,	7	,,
150 ,,	6	,,

Any increase in the sulphite content beyond 100 grams considerably retarded the rate of development, and as a minimum of fog was produced at this point, 100 grams was considered to be the most suitable proportion.

Effect of Varying the Carbonate Content.—A was maintained constant, equal to 100 grams, and B varied as follows:—

Time for Fog on Cine Positive at 80° F.

B 25 grams	3	mins.
50 ,,	3½	,,
75 ,,	4½	,,
100 ,,	5	,,
125 ,,	5	,,
150 ,,	4½	,,

The least fog is therefore produced when the content of both carbonate and sulphite is equal to 100 grams.

The most suitable formula is therefore:—

Elon	0.5	gram
Hydroquinone	10	,,
Potassium bromide	3.5	,,
Sodium sulphite (desiccated)	100	,,
Sodium carbonate (desiccated	100	,,
Water to	1000	ccs.

The effect of dilution of this formula was to increase fog as follows:—To 100 volumes of the developer C volumes of water were added.

Time for Fog on Cine Positive at 80° F.

C 0 vols.	5	mins.
50 ,,	3	,,
100 ,,	2	,,
150 ,,	2½	,,
200 ,,	3	,,

In practice on the large scale, the above developer was found to give positives remarkably free from fog even after continual use with the temperature of the developer and surrounding atmosphere at 80° F.

It was found that if the developer was splashed on the floor during working, this crystallised out and caused trouble due to particles of sulphite and carbonate dust settled on the film. This was overcome by replacing the sodium carbonate by an equal weight of desiccated potassium carbonate, since owing to the deliquescent nature of the latter, any liquid splashed around did not dry up but remained moist. The developer containing potassium carbonate was also somewhat more energetic than the one containing sodium carbonate.

The increase of the fogging action on dilution is probably due both to the increased rate of oxidation of the sulphite on dilution, and to the increased rate of penetration of the developer, since on dilution the velocity of development increased also.

The above developer is more economical than the developer according to the formula first given in this article, which contains more hydroquinone but less sulphite. The non-fogging properties of this developer are probably due to the anticatalytic action of the products of oxidation of the hydroquinone on the rate of oxidation of the sulphite and the hydroquinone.

A possible explanation of the cause of excessive fog during reel development is the heat produced by the oxidation of the sulphite, the finely divided silver image possibly acting in the same way as finely divided platinum which accelerates the rate of oxidation of coal gas in the case of the familiar gas lighter.

B. Oxidation Products formed while Mixing the Developer.—Although a developer formula usually contains enough sulphite to prevent excessive aerial oxidation during development, oxidation products may be formed during mixing if the developer is not mixed correctly. It is important to observe the following rules.

(1) Dissolve the preservative before adding the developing agent.

(2) Thoroughly dissolve the developing agent before adding the carbonate.

(3) Mix the developer as cold as possible.

If the developing agent is dissolved first before adding the sulphite, the small amount of dissolved air in the water is sufficient to form enough oxidation product to cause fog.

In the case of elon, add only a small portion of sulphite first, then dissolve the elon and add the remainder of the sulphite. This procedure is necessary because elon forms a difficulty soluble compound with sulphite and will therefore not dissolve readily in a cold strong solution.

If the carbonate is added to the solution before the developing agent is dissolved, each crystal becomes oxidised at the surface, thus causing fog.

A third cause of fog is mixing the developer too hot. Heat accelerates the rate of oxidation of the developing agent, especially after the carbonate is added, and if the concentration of carbonate is high, even if the developer is mixed in the right order, it will give fog if mixed warm. In the case of developers containing no bromide used for testing the quality of plates and for developing under-exposed negatives it is absolutely necessary to mix the developer with cold water if a minimum of fog is desired.

Oxidation products are usually formed in the developer on keeping, though most developers will keep for a long time if kept thoroughly stoppered in a full bottle free from air.

A developer should at all times be as colourless as possible. In the case of an elon-hydroquinone developer, the fog produced usually varies in proportion to the colour.

C. Impurities in the Chemicals Used.—Fogging agents may be present as impurities in the chemicals used as follows:

(1) *Oxidised Products of the Developer Formed During Manufacture.*—If the elon, hydroquinone, or pyro used is strongly coloured the presence of fogging agents may be suspected, though some coloured samples do not give any more fog than colourless ones. The way to test a developer for fogging tendency is to mix two developers according to the same formula, one with the sample, the other with a pure sample, and to develop unexposed strips of motion picture positive film, noticing the time required for fog to just appear at 70° F. The fogging power of the developers is then in the inverse ratio of the times required to produce fog.

(2) *Impurities in the Developer.*—Many metallic compounds, such as salts of copper and tin, metallic sulphides, etc., exert a powerful fogging action even when present in very minute quantities. Less than .01 per cent. of copper sulphate when added to an elon hydroquinone developer will cause fog on most positive emulsions. The precise action of such a minute trace of copper is not thoroughly understood, presumably it acts as a catalytic agent in accelerating the rate of oxidation.

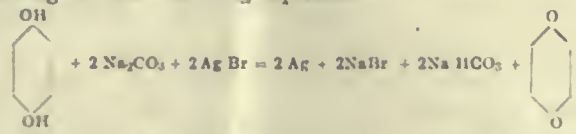
Red rubber tubing when used for conveying developing solutions is a common cause of fog owing to the solvent action of the carbonate in the developer on the antimony sulphide present as a filler in the rubber.

Stale sulphite which contains sodium sulphate will cause fog indirectly since the deficiency of sulphite will allow oxidation to proceed more easily.

Dissolved salts present in the water used for mixing the developer, unless of the above nature, seldom produce fog.

IV.—Effect of Exposure and Time and Temperature of Development.

(a) When silver bromide is developed to metallic silver with a hydroquinone carbonate developer, sodium bromide is formed in proportion to the amount of silver developed according to the following equation:—



In cases of full exposure therefore an appreciable amount of bromide accumulates in the developer, and this restrains the formation of chemical fog. This can be shown experimentally by developing an unexposed and a fully exposed plate side by side in separate trays for, say, 10 minutes, when the unexposed plate will be seen to be fogged more than the unexposed portions of the negative. The extent of the restraining action of the bromide thus formed depends on the volume of the developer used, so that in order to reduce its effect to a minimum a generous supply of developer should always be used, and the developer well agitated.

(b) Fog appears after a certain definite time interval after development commences depending on the nature of the developer, the emulsion and the temperature, and then continues to increase proportionally with the time of development. If the volume of the developer is small the bromide formed as a product of development will, of course, retard the production of fog as explained above.

As a general rule the temperature of the developer should not exceed 70° F. nor should development be unnecessarily forced in case of under-exposure, because after the maximum contrast has been secured, that is when the latent image is fully developed, fog still continues to form. An ideal developer is therefore one which gives the maximum contrast before the emulsion begins to fog, and such a developer can only be found by trial with the particular emulsion used. As mentioned above, paraminophenol (Kodelon) most nearly approaches this ideal condition with negative emulsions, even at temperatures above 70° F.

Methods of Compensating for Chemical Fog.—(a) The amount of fog produced by a developer may be reduced by adding a soluble bromide or iodide to the developer before use. The precise action of a salt like potassium bromide is not thoroughly understood though it may be explained from physico-chemical considerations, the added bromide diminishing the solubility product of the silver bromide which is about to be developed. Potassium iodide probably converts a portion of the silver bromide grains to silver iodide, which develops with difficulty.

(b) If the emulsion tends to give fog this may be compensated for by adding bromide or iodide to the developer as above, though in the case of photographic paper the colour of the developed image is affected.

It is also possible to treat gaslight paper in a bath consisting of a mixture of potassium bichromate and sodium chloride, afterwards washing and drying, thereby converting any fogged silver grains to the unfogged condition, though the process diminishes the general light sensitiveness of the emulsion.

Dichroic Fog.—This is a particular kind of fog which occurs only on negative plates, films, and lantern slides as a more or less uniform veil over the gelatine coating. When examined by reflected light the deposit appears yellowish green, while by transmitted light it appears reddish pink, hence the name "dichroic fog," which means "two-coloured fog."

When examined under the ultra microscope the fog is seen to consist of ultra microscopic particles, which by chemical analysis have been shown to consist of metallic silver. The size of the particles determines their colour by transmitted

light, a fog which is red in colour consisting of very small particles.

Dichroic fog may be formed either in the developer or in the fixing-bath. In order that the deposition of the fog may take place in the developer some solvent of silver bromide, such as hypo, ammonia, or an excess of sulphite or carbonate must be present, when under certain conditions the dissolved silver is reduced to metallic silver in a very fine state of division, particularly in the shadow portions of the negative, where no bromide is liberated during development.

Fine grained emulsions in which the grains of silver halide are very small and therefore more readily soluble are most susceptible to this form of fog, especially if the development is forced, but the fog may be prevented by the addition of a little potassium iodide to the developer.

The difference between the cause of sulphite fog and dichroic fog appears to be merely a question of the time interval between solution and reduction of the silver.

The formation of the fog most generally occurs during fixing, especially if the fixing-bath does not contain acid or if it is old and exhausted, when it contains an excess of dissolved silver and spent developer. It is possible to obtain dichroic fog with a fresh solution of plain hypo, in which case the silver salt dissolved by the hypo is reduced to metallic silver by the developer carried over by the plate to the fixing-bath. This is especially true if the gelatine coating of the plate is abnormally thick and if the developing and fixing solutions are warm. In such a case the developer does not have time to diffuse out of the gelatine film before the hypo begins to dissolve away the silver bromide. A fixing-bath containing ammonium chloride (which is added to accelerate the rate of fixing) will give dichroic fog unless the bath is kept acid, in view of the ammonia liberated by the action of the alkali in the developer carried over by the plate.

Dichroic fog never occurs in the fixing-bath if a fresh acid bath is used and if the plate is rinsed before fixing. If dichroic fog still persists when using an acid fixing-bath at a temperature not above 70° F. the trouble lies in the developer.

J. I. Crabtree.

THE VALUE OF EXPRESSION IN PORTRAITURE.

A matter to which many portrait photographers do not give the consideration that it merits, is the expression of the sitter's countenance at the moment of the exposure. In my experience and observation the one thing more, perhaps, than any other single quality, which secures approval or disapproval of a portrait, is the sitter's expression. I was speaking in this sense recently to an old photographer, now a director of a firm having several studios of good class, and he replied that he would undertake to build up a business by attention to the matter of the sitter's expression, when on technique he could not do so. It is not to be supposed that the speaker thinks slightingly of the importance of good sound photography. He recognises, as I do, that that should be the foundation on which our work should be based, but that for securing the satisfaction of our patrons he considered the presentation of a pleasing expression to be the most important factor.

To some extent the desirability of securing an agreeable expression in a portrait has been recognised from the early days of professional photography. A stock wheeze of the "comic" papers has been to represent the photographer as telling the sitter to "look pleasant." There may be photographers who use this formula; I don't remember that I ever did so. A sitter, unless in the case of a skilful actor, does not look pleasant to order. I have often known a fond mother say to her baby or young child when ready for the sitting, or even before that, "Now laugh, laugh." I have never known this to succeed. The child is too young either to understand the injunction, or to be able to take the part of an actor and assume an expression not actually in accordance with its feelings. Some playful antic on the part of the photographer is much more likely to produce the desired effect. I have often found a little game of Peep-bo to succeed in attracting baby's attention and in securing an interested expression. With sitters other than infants, conversation will naturally be the means employed. With boys a little discussion as to the relative appreciation of trigonometry and football or cricket will often induce an amused expression, but here some tact is desirable. An opening sentence or two will generally show the direction into which to guide the conversation. The leading principle is not to tell the sitter to assume any particular expression, but to say or do something likely to evoke it.

With adult sitters, tact and the avoidance of anything like taking a liberty are of the highest importance. I have known a photographer, thinking to chase away a mournful expression, tell a lady not to look as if she were in a consumption, only to be crushed by the reply, "Perhaps I am."

A photographer ready to turn to advantage any little incident that may occur may often succeed in obtaining a happy expression that will secure a good order from the negative. One such case that occurs to me is that of a young lady of German parentage, born or long domiciled here (this occurred long before the war). The young lady had good features, but when posed for the photograph assumed a stern, almost forbidding, expression which ordinary conversation failed to remove. Presently, however, her mother said something to her in German, on which I joined in with "Ach! Wenn ich nur Deutsch verstehen könnte!" (Oh! if only I could understand German!), which, being spoken in the language of which ignorance was assumed, so tickled the lady that she burst out laughing. When the ripples of laughter had subsided but an amused expression still hung about the features, a very successful portrait was secured. With French sitters, of whom there have been a good many this year, I have found that a little conversation in their own language generally induces an interested expression even if they speak English well, and particularly if they do not do so.

Since commencing to write this article I happened to be in the studio of a photographer who does a high-class business at good prices—he refuses altogether to take negatives for postcards—when a lady came in bringing with her a friend for a sitting. The lady complimented the photographer on her own portrait, which she said was the only one that she had with a satisfactory expression, and that she was really rather ashamed of having given away such a large number of her own portraits. Depend upon it, there is more in the value of the expression in portraiture than most photographers realise.

W. E. Debenham.

THE PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

Report of the Council for 1918.

During the year 151 new members have joined the Association. As it is in some cases impossible to determine whether a member who has joined up is to be considered as continuing to be a member, it is not possible to give the precise membership of the Association, but the fact that there are 915 subscriptions which have been paid during the current year shows that the progress of the Association may be considered satisfactory.

The following table shows the subscriptions collected for the past five years.

1914	...	772	Congress.
1915	...	812	,,
1916	...	729	No Congress.
1917	...	888	,,
1918	...	915	,,

At the last annual general meeting a resolution was passed "That the Council be requested to consider the practicability of training and employing disabled soldiers and sailors as photographic workers, and make a report." The Council had considerable difficulty in determining how to deal with the matter, from the fact that the precise matter the Council was requested to consider could not possibly be that implied by the literal reading of the resolution, it being obvious that many forms of disablement would not materially affect those who suffer from them so as to prevent their being trained and employed as photographers, and upon the question whether it would be wise to encourage the idea that after a short training in photography anyone of ordinary capacity would be able to acquire sufficient knowledge and skill to earn a livelihood, which appeared to be the true object of the reference, the answer was so dependent

upon the situation after war, the end of which was not then in sight, that the Council could not express an opinion. The report issued stated at length the considerations involved and the reason the Council could not offer a definite opinion.

The Council have to thank Messrs. Kodak, Limited, and the Editor of the "Professional Photographer" for their kindness and courtesy in printing our President's appeal to photographers to join the Association, and also inserting an application form, the result being the accession of about ninety new members. Thanks are also due to the Editor of the BRITISH JOURNAL OF PHOTOGRAPHY for inserting reports, information, and helpful references to the Association's work.

Negotiations between the Royal Air Force, urgently in need of photographers, and the Association, anxious to assist the R.A.F. in their need by finding qualified men, resulted in our efforts being rendered unavailing owing to the extraordinary attitude of the R.A.F. officials. A full account of what happened has been published in the "P.P.A. Circular."

Owing to the difficulties of resettlement after the disorganisation caused by over four years of warfare, the Council have not been able to arrange for a Congress in 1919, but arrangements are already being made to hold one in 1920, which, it is hoped, will be as beneficial to members as the five previously held.

On the institution of the Society of Master Photographers (Lancashire and District) application was made to the Council for affiliation to the Association; as the activities of the new Society covered a wide-spread district, in that way differing from a local branch, the Council acceded to the application.

Before the end of the war was in sight the Council were preparing to take the necessary steps to secure early discharge for such of the members who were serving in the forces and anxious to return to their businesses, and the necessary steps were taken, as far as military conditions would allow, to act at the proper time. After the armistice, on the Government scheme of demobilisation being published, it was found to be of such a nature that no application of the Association would be of further avail than his own or of that of his wife or other relations, and that any cases of undue detention would be due to faulty administration and not to defect in the method of the scheme.

In the last annual report it was mentioned that the Fine Art and General Insurance Company had given notice to terminate their arrangement with the Association. The Council have entered into a new arrangement with the Eagle, Star, and British Dominions Insurance Company under which members can have their insurances effected on the same terms as before. The new arrangement has been in force since May last.

Meetings of the Council have been held monthly throughout the year. The attendance of an average of sixteen members of a total of twenty-seven, thirteen being country members, is evidence of the continued interest in the Association of those who are responsible for its management.

The "P.P.A. Circular" has been published with regularity during the year, and judging from the appreciatory references, has assisted the Association work and brought its members into closer touch with each other.

Parliament, having agreed upon the principle of a tax upon luxuries, appointed a Select Committee to consider and report what articles ought to be classed as luxuries subject to the tax, and the representative organisations of various trades and others interested were invited to appear before the Committee and state their views as to the adjustment of the duty to the articles in which they were interested. As the interests of photographers as a profession are identical with those of the photographic manufacturers and dealers, an arrangement was made with Mr. Edgar Houghton, President of the former and a member of the Council of the latter Association, who was to appear before the Committee on behalf of those Associations, to represent our interests also. It had been intimated that the schedule of the French Luxury Tax would be taken as a basis for the British schedule, the articles affecting photographers in the latter being—

Photographs, portraits, exceeding in price, per dozen, 40 francs.

Photographs, enlargements, exceeding in price, each, 30 francs.

On our behalf it was submitted that the limit of price for our own Act should be—Photographs, portraits, exceeding per dozen 42s., and enlargements 30s. each.

On the report of the Select Committee being published it was found that the limit of price we suggested had been adopted, but by the omission of the word portraits, the tax was made to apply to photographs of any kind. As, clearly, many descriptions of photographs, such as those taken for commercial, technical, and scientific purposes, cannot justly be regarded as luxuries, on the introduction of Mr. Lang Sims a deputation of the Council had an interview with Mr. Davison Dalziel, a member of the Select Committee, to represent our views. On stating our case, Mr. Dalziel expressed his appreciation of the position and his concurrence with our views, and promised to represent this aspect of our case to the Chancellor of the Exchequer.

Should taxation on the same lines form part of the next Budget, the Council are preparing to watch proceedings in the interests of our members.

THE BRITISH INDUSTRIES FAIR.

THE fifth of the "Fairs" organised by the Department of Overseas Trade is this year again held in the Pennington Street premises of the London Docks, a horribly inaccessible position, but one which certainly provides abundant space for the large number of stalls. The Fair is limited to British manufacturing firms engaged in the trades concerned with porcelain, china and glass, fancy goods, stationery and printing, paper, toys, and games. The firms whose manufactures possess a photographic interest are chiefly to be found in the K Section devoted to stationery and paper, but some others are located in other sections.

Frames and mouldings form a large exhibit of Messrs. Bennett and Jennison, Limited, Wellington Works, Grimsby, whose manufactures in the way of wood mouldings and frames of all descriptions are well known in the photographic trade. Their distinctive goods, consisting not only of ornamental wooden frames, but of those in metal, are shown by Messrs. Marion and Foulger, Limited, 3, Soho Square, London, W.1.

In mounts the most attractive display is that of Messrs. Bartons, Conway Works, Finch Road, Handsworth, Birmingham, who give great prominence, but no more than the artistic quality of the articles merit, to their "Quadro" metal passe-partout framing, the effectiveness of which for both large and small work is very convincingly shown. Albums of many types are shown by the old-established firm of William Johnson and Sons, 8, Union Street, Southwark, London, S.E.1; whilst some distinctive styles in mounts, designed for use in connection with memorial photographs, are exhibited by Argent Archer, 140, Kensington High Street, W.8.

From mounts to mountants is a natural step, and we were interested in seeing at the stall of the Leadenhall Press, 29-47, Garden Row, Southwark, London, S.E.1, exhibits of adhesive pastes for photographs, which are issued not only in the glass pots for amateur use, but are sold in bulk to professionals. The firm has also a cheap but highly adhesive paste, marketed as "Fixol," which, though it is not issued as a preparation of the highest degree of purity demanded in a photographic mountant, is nevertheless one which in these days of development prints could be used for mounting purposes. It is certainly a preparation which is applied in the smoothest manner, but possesses extraordinary adhesiveness. A gum preparation for the mounting of photographs and albumen colours for the tinting of photographic prints, lantern-slides, etc., are among the exhibits of the British Drawing Ink and Adhesives Manufacturing Company, 31, Great Ormond Street, London, W.C.1.

The rotary printing of postcards and other descriptions of photograph, such as those for box covers, calendars, cigarette stiffeners, and other commercial purposes, is represented by a number of firms. The Rotary Photographic Company (1917), Limited, West Drayton, Middlesex, now a British concern, shows a wide range of its productions, including a large proportion of coloured postcards. Messrs. Philip G. Hunt, 332, Balham High Road, London, S.W.17, give prominent display to their old-established connection with this business, and particularly to their facilities for supplying series of view postcards from their own stocks of negatives. Messrs. Lilywhite, Limited, Dunkirk Mills, West End, Halifax, Yorks, show examples of their specialties in the same industry, among which are humorous cards in three-colour, postcards for seaside sale, and photo cut-outs and paste ons for the jewellery, framing, and other trades. Messrs.

E. T. W. Dennis and Sons, Ltd., Printing House Square, Scarborough, also show their productions in this line.

The exhibits of the pencil makers, an industry which, it may be hoped, now supplants the Austrian output, are of interest mainly from the fact that retouching leads for use in the customary metal holder are among the specialties of both Messrs. Arthur Johnson, Limited, Britannia Pencil Works, Neasden, N.W.10, and Messrs. E. Wolff and Son, Limited, 82, St. Thomas Street, London, S.E.1.

Among other miscellaneous exhibits must be mentioned the fine reproduction work of the Rembrandt Intaglio Company, Queen's Mill, Lancaster, and the Sun Engraving Company, Limited (formerly André Sleigh and Anglo, Limited), Milford House, Milford Lane, E.C.2. Messrs. Wiggins, Teape and Company, Limited, 10-11, Aldgate, London, E.1, although having large interests in the manufacture of ledger, cartridge, blotting, and writing papers, devote their exhibit almost exclusively to photographs illustrating the raw paper base which during the war they have manufactured in increasingly large quantity, and for which they are laying down a special mill. H.M. Queen Mary, on her visit to the exhibition on Monday last, expressed herself interested that the British paper-makers were rendering the manufacturers of photographic materials independent of enemy products. The Aerograph Company, Limited, 43, Holborn Viaduct, London, E.C.1, show examples of their goods not only in the colouring and working-up of photographs, but of the many industrial applications of their air-brushes. The Tella Camera Company, 1, Southampton Row, London, W.C.1, exhibits its work in commercial and technical photography and illustrations. At the stand of Messrs. A. E. Gray and Co., Ltd., Glebe Works, Mayer St., Hanley, Staffs, we saw specimens of grooved tanks in semi-porcelain, as used for development and fixing. Mr. Thomas Bethell, Boundary Place, Liverpool, shows in the toy section the cardboard cameras and dark-slides by which, for many years past, children have been able to make a first acquaintance with photography at the cost of a few shillings.

It should be said that the Department of Commercial Intelligence, in organising the Fair, undertakes no small amount of investigation into the *bona fides* of the exhibitors, in respect to their being actual manufacturers and of British constitution. Admission to the Fair is understood to be by invitation of the Department, but we imagine that any *bona fide* buyer who wishes to visit the Fair will receive consideration on application to the Department at 10, Basinghall Street, London, E.C.2.

Assistants' Notes.

Celluloid Facing.

PHOTOGRAPHIC miniatures, which are so popular with the working-classes, are easily made; the important factor is the time taken up. By means of the card repeating back four-pictures are made on a quarter-plate. Sometimes the original requires the background painted out with Chinese white, or a few touches put in with lamp-black water-colour to make a bold effect. Of course, these touches are sponged off after making the negative, which should be on the contrasty side. Four pictures are made on one piece of glossy paper to give sharp detail, and then coloured by dyes. Celluloid facing gives an enamelled appearance, and by its attractiveness helps the sale. For cementing without hot rollers use 4 parts methylated spirit, 1 part amyl acetate. Do not increase the amyl acetate unless the celluloid is thick. This is best for gelatine papers, such as glossy P.O.P. and bromide. Do not use this with collodion papers, as it dissolves the image. Cut a piece of celluloid a little larger than the print, put a few drops of above in the middle of same, then press from the centre all round outwards, in contact with blotting-paper. By making the facing little larger than the print the excise cement reaches the blotting-paper and does not get on the face of picture spoiling the high gloss. With a little practice the right number of drops will be found, and no air bells formed. Major's cement, which is gelatine dissolved in glacial acetic acid, is more suitable for collodion papers, is slow in working, and if you use this cement for glossy P.O.P. and the picture should slip in the pressing down, you will find the acid has softened the image and the movement blurred the picture. Collodion papers are not suitable for dye work.—BURLINGTON.

Photography with the Royal Engineers.

ACCOUNTS of the part that photography has played in the war have so far been written principally in terms of aircraft observation. While no doubt this branch has employed more men and material than any other, and has been both organised and advertised in the energetic and efficient way characteristic of the Air Force, there has been a vast deal of photography done in connection with other departments that should not be lost sight of in considering photographic war-history. The work of official photographers of a kind that used to be done by war correspondents is, of course, also well known, as is the development in radiography; but the photography carried out by men of the Royal Engineers has been not only extensive and varied in character, but it has not met with the recognition that its importance and quality deserves.

Of work that takes the operator well up into the danger zone is the making of panoramic views of enemy trenches and territory. Then there is "sound-ranging." This is a marvellously ingenious and scientific method of locating enemy guns very exactly. The apparatus was invented by a Frenchman and improved by us, and as the Germans have never succeeded in capturing an instrument nor in remotely approaching the idea in efficiency, this has been a great factor in our success. The part of the photographer in this branch calls for decreasing knowledge and skill as the instrument is improved, but it calls for mention in a record. This is only one of the many rapidly growing activities of a Field Survey Battalion. These units are more generally known in the Army under the concise and expressive name of "Maps."

Enormous quantities of maps are plotted, drawn, and printed "in the field," and the photographer has his share in reproducing them to various scales, both on wet and dry plates, including, of course, panchromatics. Many of the workers are old "Ordnance Survey" men, but they are not now by any means in the majority. Besides the operators there are men who print the line negatives on to zinc plates for the lithographic printers, and those who print in special variable details by true-to-scale processes. Then there are the highly skilled "glass engravers," as they style themselves, or "negative-scratchers," as would-be humourists call them. Their work, delicate and tedious, done principally with a finely sharpened needle and a magnifying glass, is at its best compared with ordinary commercial retouching as the latter is to scene-painting.

In a published account of the success of the Intelligence Corps were mentioned, in passing, the expert photographers as assisting in its work. These also are men of the Royal Engineers. The field of photography even here is varied enough to try the skill of the best. Copying and printing in large numbers portraits of suspected persons is only one small item. These often have the unmistakable appearance of being already copies of the third or fourth generation—if I may use that expression—and badly done at that; so that to make good printing negatives to give useful results is not always easy. Copying documents and posters to be used in convicting enemy officers of illegal executions is work that one could take pleasure in, notwithstanding the weird colours and crumpled conditions of some of them. Photographing parts of captured mechanism for various departments is frequently required, and even work of very technical and experimental character is successfully coped with, although it will be recognised that material, when it arrives at the place of use, often has already had a long history of careless handling and bad storage behind it, and, therefore, cannot always be considered as of A1 category.—D. CHARLES.

Ply Wood.

THREE-PLY wood is now available for photographic purposes, the various restrictions having been withdrawn, and is a useful material for either carbon transfer or for mounting enlargements. Cardboard mounts require a further backing of wood when framed, whereas a picture mounted on ply wood would go straight into the frame, having a nice appearance at the back; so if we take this advantage into account the price will compare favourably with cardboard. Ply wood is made in various woods, up to seven-ply for special use, but for mounting purposes three-ply birch, which can be had "free from knots one side," will answer studio requirements. The albumen in the wood, by steam treatment, is made somewhat insoluble; though some call it "waterproof three-ply," it certainly is less absorbent than the ordinary sort, and less liable

to wood-worm. It does not split like ordinary panels, is superior to canvas, as holes cannot be knocked through it, can be got any size and cut any size, stretchers are dispensed with, and is the material the old masters would have welcomed with open arms.—BURLINGTON.

Patent News.

COMPLETE SPECIFICATIONS ACCEPTED.

These specifications are obtainable, price 6d. each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

PRINT WASHERS. No. 122,371 (January 18, 1918).—To receive the prints there is employed a preferably oval basin for water in which the prints may be immersed, the basin being formed with pockets communicating with the interior of the basin by way of perforations in the side, and being formed with a double bottom the inner member of which is perforated.

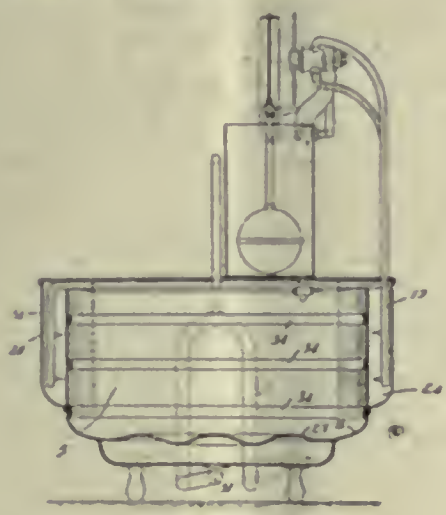


Fig. 1.

Characteristic of the invention is the formation of the interior of the basin where the side wall joins the bottom as a concavely curved surface, above which are ribs presenting convex surfaces whereby prints or the like are kept from adhering to the side of the basin.

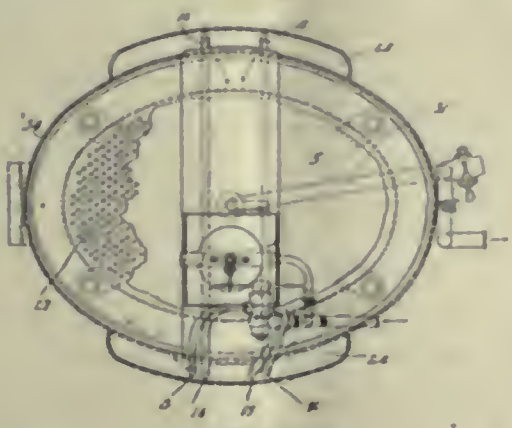


Fig. 2.

In the drawings the conduit pipes 13, 14, 15, and 16 deliver water to the basin, the pipes 13 and 15 being led to the pocket 24 outside the basin 5, and the pipes 14 and 16 being led to the pocket 28. The basin 5 communicates with the pockets 24 and 28 by way of perforations in the side of the basin.

The basin is drained from the bottom by a waste pipe 31.

To prevent prints from getting into the pipe 31, the basin is formed with a double bottom of which the inner member 27 is perforated and formed with an undulating surface—with the object of assisting in separating and turning over prints that may tend to sink.

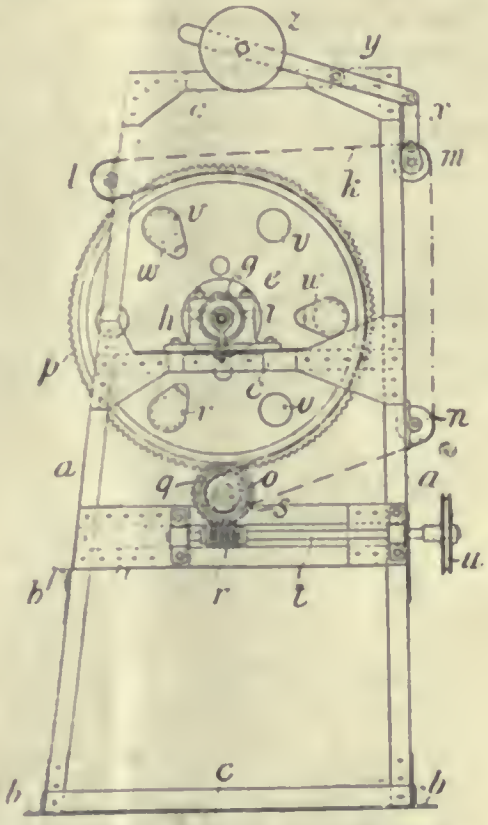
34 denotes internal ribs on the side of the basin presenting smooth convex surfaces.

At the junction of the vertical lateral wall of the basin with the inner member 27 of the bottom the inferior of the basin is concavely curved as shown at 35.—Peter Hugh Waddell, Troon, Ayrshire.

PRINT-DRYING MACHINES.—No. 121,936 (Sept. 24, 1918).—The invention relates to machines for drying blue prints and other photographic copies of drawings and to that class of such machine wherein a heated cylinder has arranged in combination with it an endless band mounted upon rollers, so located that the band bears against a considerable portion of the surface of the cylinder and wherein the cylinder and band are caused to move at the same surface speed, so that sheets of paper inserted between them will, as the cylinder is rotated, be maintained in contact with it for a sufficient time to dry.

The drying cylinder is arranged in an open frame, and one end of the cylinder is provided with external teeth with which a pinion, on the shaft of one of the rollers around which the travelling apron runs, engages, so that when the said shaft is rotated the drum and apron will be simultaneously operated.

The frame of the machine is preferably constructed of corner



bars, *a*, *a* of angle metal united by longitudinal bars *b*, *b* and transverse bars c, *c*.

The drying cylinder is provided with end discs *e*, *e*, to which tubular hubs or bosses are fixed, these bosses being mounted in bearings *g*, *g* in the frame and having a gas-pipe *h* for the heating burner extending through them in the usual manner. The gas-pipe, as shown, is carried in eye bolts *i*, *i*, and a space may be left between the pipe and the bosses for the admission of air to the drying cylinder. *k* indicates the travelling apron and *l*, *m*, *n*, *o*, the rollers upon which it is mounted.

To one end of the cylinder is fixed a ring p having peripheral teeth, and on the shaft of the roller o is a pinion q engaging with the teeth, so that as the shaft is driven the cylinder also will be rotated and the apron k at the same time caused to travel. These teeth may be formed by securing a pitch or sprocket chain around the cylinder or a ring thereon, with which links the pinion will be adapted to engage.

The shaft of the roller o is driven by a worm r and worm wheel s, the shaft t on which the worm is mounted preferably receiving its motion from an electric motor through a band or belt running on a pulley u.

Holes v, v are formed in the ends of the drum, some of which may be provided with movable covers w, w for regulating the temperature of the drum by controlling the escape of the products of combustion and the admission of air.

To regulate the tension of the band or apron k the bearings of the roller m are suspended by links x from levers y, y, pivoted on the frame and provided with adjustable weights z, z.—Sydney Harold Morse, Finsbury Pavement House, London, E.C.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

SATURDAY, MARCH 1.

Edinburgh Photographic Society. "Sir David Wilkie, R.A." R. T. Skinner.

MONDAY, MARCH 3.

Bradford Photographic Society. "An East Coast Ramble." W. H. Atkinson.
Dewsbury Photographic Society. "York City and its Minster." A. T. Dawson.
South London Photographic Society. "Sketch Portraiture." H. C. Inskeep.

TUESDAY, MARCH 4.

North Wilts Field and Camera Club. "Photographic Odds and Ends." C. L. Richards.
Hackney Photographic Society. Selection of Slides by A. J. Linford and W. Selfe.
Chelsea Photographic Society. Dark Room.
Royal Photographic Society. "Hints and suggestions for use in the dark-room and work-room." V. Jobling.

WEDNESDAY, MARCH 5.

Croydon Camera Club. "More Curiosities seen under the Microscope." G. Ardaseer.
Dennistoun Amateur Photographic Association. Annual General Meeting.
Tunbridge Wells Amateur Photographic Association. "The Swiss Alps." R. Gorbold.

THURSDAY, MARCH 6.

Liverpool Amateur Photographic Association. "Across Canada and a Few Sporting Experiences by the Way." A. Reid.
Brighouse Photographic Society. "Ups and Downs of Caravanning." T. O. Askew.
Huddersfield Naturalist and Photographic Society. Exhibition of the Y.P.U. Prints and Slides.
Hammersmith (Hampshire House) Photographic Society. "Trimming and Mounting." G. C. Weston.
Rodley and District Photographic Society. "Platinotype." H. Crossley.
Wimbledon Camera Club. "Orthochromatism." T. W. Darrington.
Birmingham Photographic Art Club. "Nature's Wonderland." H. Thompson.
Richmond Camera Club. Affiliation Slides, 1918.

THE PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

A meeting of the Council was held on Friday, February 14. Present: Messrs. A. Basil, Gordon Chase, A. Corbett, A. Ellis, S. H. Fry, W. E. Gray, R. Haines, G. Hana, A. Mackie, Lang Sims, R. N. Speaight, M. Adams (Reading) F. Brown (Leicester), W. B. Chaplin (Windsor), I. Chidley (Chester), and Montague Cooper (Taunton).

The Chairman said that the meetings were now extended to such length as to cause serious inconvenience to many members. Meeting at 6 it constantly occurred that the proceedings lasted until 9. He suggested that in future the metings should close at 8.30. This was agreed to.

Letter was read from Mr. W. Illingworth, suggesting that the Photographic Press be invited to attend the Annual General Meeting to report its proceedings. After discussion the suggestion was put as a resolution and lost. Mr. R. N. Speaight raised the matter of the reports of meetings in the "British Journal." He thought the meetings should be more fully reported and in less formal style. He thought that the names of the movers and seconders of resolutions should be given, instancing that at the last meeting he had proposed a resolution, which was not adopted, that had not been reported. The Hon. Secretary replied that, with the duties he had to perform at the meetings, it was impossible for him to take notes, and that a full report of the proceedings was only possible if they had a shorthand reporter. It was not the duty of an hon. secretary to report proceedings. He had been connected with ten or a dozen societies, and in every case there had been an official reporter or a member appointed to act as recorder, whose duty it was to record the proceedings and be responsible for them. In the early days they had a shorthand reporter, but even then lengthy reports were not often possible, as so much of the business consisted of matters still under consideration, which it would be inadvisable to publish in their immature state. If fuller reports were considered necessary there must be a shorthand reporter. After some discussion Mr. Lang Sims said he would bring his daughter, who was an efficient shorthand writer, to the next meeting.

Letter read from Mr. H. J. Rigden, auditor of the Association's accounts, criticising the way the balance sheet was made out and explaining how he thought it should be done. The Hon. Treasurer said that Mr. Rigden had raised his objection at the time of auditing the accounts, and that he, the hon. treasurer, had pointed out that the method adopted was that he had inherited from his predecessor. The balance sheet gave a clear indication of the financial position of the Association, which could mislead no one. There was something to be said for Mr. Rigden's contention from an accounting point of view, but it was only a matter of form.—After discussion it was agreed that no alteration should be made in the way the accounts were presented. The Hon. Treasurer stated that the February number of the P.P.A. Circular containing the notice of the Annual General Meeting, the Statement of Accounts, the attendances of members of Council, and the ballot paper was in print and would be sent out within the next few days. All members in suspense on account of army service would receive a copy. He also reported that he had arrived at a settlement with the Inland Revenue Authorities as to the amount of the Association's liability for income tax on its invested funds. Mr. R. N. Speaight called attention to a letter which had appeared in the correspondence columns of the "British Journal," signed by a member of Council, in which personal opinions were stated in such terms as to suggest they were opinions of the Council. He thought that members of Council in writing to the Press should be careful to make it clear that they were only expressing their own ideas, and should not refer to what had taken place at Council meetings.

A discussion was opened upon a paper of suggestions for the future conduct of the Association by Mr. Mason Adams; further consideration was deferred. Mr. Montague Cooper raised a technical point with regard to the proceedings at the January Special Council Meeting. The chairman read the rule and explained that the formality that Mr. Cooper stated had been omitted was unnecessary in the circumstances.

ROYAL PHOTOGRAPHIC SOCIETY.

MEETING held Tuesday February 25, Mr. E. W. Mellor, F.R.P.S., in the chair.

Mr. G. Avenell delivered a lecture, illustrated with lantern slides, on the West of England, his discourse taking the place of that by Mr. W. J. Roffey on "Some English Cathedrals," which had had to be unavoidably postponed. Mr. Avenell took his audience with him among many of the picturesque districts of Dorset and Devon, and had much that was interesting to say on the churches and other ecclesiastical foundations of the two counties. The scenery of Exmoor provided the opportunity for many attractive studies, and the lecturer introduced an eminently human element by showing a photograph of half a dozen girls on the heights of Dunkery Beacon and explaining that, despite his age and baldness, he had subsequently married one of them.

The hearty thanks of the meeting were accorded to the lecturer.

CROYDON CAMERA CLUB.

THE latest postcard circular states that "New gas fires are fitted to the club-room, which is now warm and comfortable," a fact which gives no suggestion of a terrible conflict waged between Mr. Sellors and the Croydon Gas Company as to whether the previous obsolete patterns should be discarded and up-to-date ones installed. Only when the officials of the company realised who they were up against, and that their persons were in danger of increasing in value by conversion into by-products, did capitulation occur. The immediate benefit arising from the change consisted in the frost breaking up as a matter of course; so balmy, comparatively speaking, was the atmo-

sphere last week that even Dr. Knott abandoned his usual sane habit of posing as a fire-screen.

Recently the syllabus has admirably indicated fixtures in which a lecturer down for any particular evening, will almost infallibly not turn up on the date assigned him. By any weird chance if the two do happen to coincide, the topic announced, and that actually dealt with, frequently will be hardly on speaking terms. It must be clearly understood, for he has so stated, this is not the fault of the secretary, who obviously must be the victim of a wicked and widespread conspiracy among lecturers to lead him astray. Bitterly he has declared that he washes his hands of them so far as relates to dates and titles.

Last week Mr. B. J. Rose, billed for a future date, kindly filled a breach caused by that wretched 'flu, and crystallised two informal summer demonstrations into one coruscating evening on "Pinhole Photography." No member of the club has a firmer foothold on pinholes than Mr. Rose, and the wonderful definition he obtains is highly interesting. Interesting also were the simple box cameras, enlargers, and stereo-cameras shown, and also a pinhole stereoscope; a few, however, failed to coalesce the pictures with the last.

The lecturer's latest method of making the pinhole is as follows:—A piece of thin sheet brass, or the portion of the inner cover of a cigarette tin, is placed on a slab of lead, and a ⅛th ball bearing (or thereabouts), moistened for adhesion, is placed on top and given a slight tap with a light hammer. This gives a perfect half-spherical dent, the convex side of which is now rubbed down with a slip stone. The dent is centrally pierced on the concave side with the point of the needle, and further rubbed down, these operations being repeated several times until the hole can be traversed by the needle almost up to its head. If on the first insertion of the needle the metal breaks away irregularly, too much has been taken off by the stone, and the piece should be discarded. For normal extensions on a quarter-plate a No. 9 needle, about 1-50th inch in diameter will, he said, be found very suitable.

The pinhole is mounted convex side towards the plate, and can be blackened with india ink and a trace of gum. As a matter of fact all the prints shown were from negatives taken with unblackened pinholes. Although this apparently had no injurious effect on definition, yet blackening appears desirable, as a glittering edge might cause general fog over the plate, and possibly markings by reflection of bright objects. One or two prints did show markings, not unlike "flare."

An animated discussion followed the lecture, the many questions asked showing the interest taken in the subject. In reference to some square "pinholes" of novel construction shown by Mr. Rose, Mr. A. F. Catharine gravely pointed out that their shape should entirely eliminate spherical aberration. It sounded sense, and many members looked duly impressed; it was a pity that others laughed and gave the show away. A most hearty vote of thanks was accorded for a demonstration of unusually complete character, one which must have entailed a lot of preparation.

South London Photographic Society. At the last meeting Mr. W. F. Slater gave a demonstration of Velox and Transferotype printing. Mr. Slater introduced his subject by stating that a gaslight paper is a development paper which can be safely handled in daylight, and did not necessarily mean a paper to be printed by gaslight. Soft Velox was 1-60th the speed of Kodak bromide, and vigorous Velox 1-3rd the speed of the soft grade. Because negatives varied in contrast it was necessary to use varying speeds of papers, and as contrast was governed by development, the makers of soft and vigorous grades of papers supplied a means whereby errors in development in the negative could be partially rectified in the print. Vigorous Velox for soft negatives and Soft for vigorous was recommended. The grade of paper to be used was governed by the contrast of the negative, not by density. A glass-backed printing frame was a great aid where shading had to be done, as one could look through the paper and see the portions requiring treatment. Exposing by magnesium ribbon was demonstrated, it being pointed out that the amount burnt should be kept to one fixed standard, and the distance varied according to the density of the negative; but when printing, and using the ordinary household gaslight, it was advisable to vary the time of exposure, and to keep the frame at one fixed distance, for preference on a box, face upwards, directly under the light. There is no such thing as over-development of gaslight or bromide papers; if the resulting print is too dark, it merely points to over-exposure; if too light, under-exposure. Development to finality was strongly recommended, and demonstrated by the following test:—An exposure on Velox was made, and one-half of the paper immersed in the developer for about two minutes; the other half was then slipped in until the whole print was immersed, and development continued until no join was seen. This constituted finality in development, and from a print treated in this manner the exposure could be correctly judged; in fact, this was the only reliable test. To avoid stains the print must be rinsed between the development and fixing, and kept well covered by the latter. To remove stains a bath of hypo and ferrocyanide was to be used. Rich sepia tones could be obtained on Velox if the development was full and the print was first placed in the toning bath, then transferred to the reducer, and again placed in the toning bath. Mr. Slater demonstrated the transferring off Transferotype to plain glass, opal, and single transfer paper.

Commercial & Legal Intelligence.

Legal Notices.—Notice is given of the dissolution of the partnership between Mark Heron and Abraham Wechsler, carrying on business as enlargers and artists, at 67, Great Ducie Street, Manchester, under the style of the Central Art Studios. All debts due to and owing by the late firm will be received and paid by Mark Heron.

NEW COMPANIES.

Local Views, Ltd.—This private company was registered on Feb. 17 with a capital of £5,000 in £1 shares. Objects: Printers, engravers, publishers, book, postcard and print producers, photographers, etc. First directors: J. F. J. Grimm, 4, Adya Lawn, St. Paul's Avenue, Cricklewood, N.W.2, printer, and H. V. Woodward, 43, Conyers Road, S.W.16, printer. Registered office: 9, Goswell Road, E.C.

British Illustrations, Ltd.—This private company was registered on February 19 with a capital of £5,000 in £1 shares. Objects: To take over the business of press photography carried on by S. E. K. Richardson at 4, Johnson's Court, E.C., as the "News Illustrations Co., Ltd." The subscribers (each with one share) are: S. E. K. Richardson, 50, Rowfant Road, Balham, S.W.17, journalist, and J. W. Parker, Athlone, Granville Road, S.W.18, journalist and photographer. First directors: S. E. K. Richardson (permanent), J. W. Parker, and W. W. Gore. Registered office: 4, Johnson's Court, Fleet Street, E.C.

News and Notes.

Messrs Lilywhite, Ltd., inform us that they have now got back a sufficient number of men into their trade printing department to justify their drawing the attention of photographers to it, as they do in an advertisement in another page of this issue.

Argo Frames.—A correspondent would like to discover the address of the maker of gilt-metal frames issued as "Argo" or "Arco," and believed to originate in Birmingham. If any of our readers have the information they would oblige our correspondent by communicating with "Argo," care of the Editors.

Dream Portraits.—Many readers having at one time or another written to ask how to make the combination photograph in which a second portrait is vignetted into one of a sitter, it may be of interest to state that the work is a specialty of a firm of trade workers, Army and Navy Studios, Aldershot, by whom the necessary composites are made from any two portraits.

Press Photographic Agency.—We are glad to be able to say that the joint proprietors, Messrs. Harold Outram and G. W. Lymbery, of this agency for placing photographs with the Press, are now returned to their business after a fairly long spell in the

Service. As one of the smaller agencies in which individual attention is given to clients' commissions they will, we are sure, speedily regain the custom from photographers which has been interrupted by their absence in the Army.

THIOCARBAMIDE.—The British Drug Houses, Ltd., 22-30, Graham Street, London, N.1, writes:—"Our attention has been called to a statement in the BRITISH JOURNAL OF PHOTOGRAPHY of February 14, 1919, page 80, under the heading 'Bleach for Bromides,' to the effect that thiocarbamide is a German product, and is now unobtainable. We beg to be allowed to correct this statement, and to inform your inquirer that we have manufactured thiocarbamide in our laboratories for several years past, and we are now able to supply any reasonable quantity from stock."

DARK-ROOM ILLUMINATION.—In reprinting in "Camera Craft" the article on the fitting-up of the dark-room from our issue of August 30, 1918, Dr. D'Arcy Power, of the staff of our San Franciscan contemporary, describes his own method of dark-room illumination, which it will be seen is of a kind which we have often advised but which nevertheless obtains an added recommendation in coming from so practised a writer. Dr. Power writes:—

For many years I have employed indirect illumination in my dark-room, in which I am constantly developing plates of high sensibility, always orthochromatic, and frequently panchromatic. While I always have an abundance of light, I think I can safely say that my negatives are free from any signs of fog. The method that I have employed is one that can be carried out with the greatest of ease, costs but little and gives results which only need to be experienced in order to be appreciated, and I use direct light only for the momentary examination of plates. Over the full length of my developing table is a shelf, its back edge fitted close to the wall, light-tight at point of contact, this shelf inclining, directed upwards at an angle of about sixty-five or seventy degrees. This shelf is simply a ten-inch plank, although it might be better to have it a little deeper. Its upper or inner side is painted white and the walls of the room are light coloured, a light red, although I believe a yellow tint would be preferable. On the inside of the trough formed by the shelf are four electric bulbs, one dark green, and the fourth an open white light, operated by switch buttons on the outer side. In general, the red is used for plate work, the yellow for bromide paper, the green occasionally for panchromatic work, and the white, of course, for general illumination. The light falling on the inclined surface of the shelf is reflected upwards to the walls and ceiling, from which it is again reflected, illuminating the room to such an extent that with only the red light turned on it is quite possible to see everything in the room with ease and comfort, even to reading the labels without difficulty, and I have never found this indirect light to cause fog on a plate. I rarely use any other light for determining when my development is completed; but, if it be thought necessary to do so, I can employ direct light. Opposite each of the four lights is an opening in the shelf, these closed by a piece of groundglass on the inside, and a dark slide on the outside. This enables me, by simply drawing the desired dark side, to make use of direct transmitted light for the momentary examination of the plate. In my own practice I rarely find need for this provision, but I realise that in some cases, such as in X-ray plate development, there is a real need for the use of direct illumination. I have not only used this method myself for many years, but I introduced it to the notice of one of our leading local radiographers, whose daily work is quite heavy, and he is loud in its praise. I sincerely hope that any photographer re-building his dark-room will try this method of lighting, doing so with the full assurance that he will never think of using anything else.

FORTHCOMING EXHIBITIONS.

February 22 to March 8.—Edinburgh Photographic Society. Secretary, George Massie, 10, Hart Street, Edinburgh.

April 17 to May 22.—Hammersmith Hampshire House Photographic Society Annual Exhibition. Two open classes. Entries close March 13. Joint secretaries, J. G. Abrahams, 41, Hamilton Terrace, London, N.W.8; A. H. Page, 12, Lime Grove, London, W.12.

Correspondence.

**** Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

**** We do not undertake responsibility for the opinions expressed by our correspondents.*

AERIAL CAMERAS.

To the Editors.

Gentlemen,—As one who is deeply interested in aerial photography, and who knows the capabilities of the R.A.F. cameras (which are second to none), I regret to think that it is possible that such an article as the "Future of Aeroplane Photography" could appear in our leading photographic journal. Yet, perhaps, it is just as well that it has been published; it will wake up the powers that be, so that the British public may learn what great strides have been made in aerial photography.

Mr. Holst may be a designer and instructor of aerial cameras, but he should not make definite and sweeping statements about cameras of which he could possibly know nothing, the design and make of the R.A.F. cameras being secret. Suffice it to say that Mr. Colin Williamson's automatic and semi-automatic aerial cameras are years in advance of the camera mentioned in this article.

The Williamson "Aerocam" not only does what the inventor of the Brock camera claims, but much more, and it was doing it in 1915. Since then things have moved very rapidly.

Hoping you will give this letter publicity, I enclose my card.—Yours faithfully, ONE WHO KNOWS.

February 22, 1919.

To the Editors.

Gentlemen,—The most interesting article appearing in your issue of the 21st inst., under the above heading, whilst doing full justice to the particular camera designed by the authors, is, in my opinion, grossly unfair in that it ignores the existence of similar apparatus which was in use long before the "Brock."

Certain sweeping assertions such as "the mapping use of aeroplane photography has been to a certain extent set back by the war, photographic apparatus . . . . adapted to this class of work. . . . excludes . . . any instrument rigidly attached to the aeroplane, surveying work must be obtained by an automatic camera," ought not to pass unchallenged. However, the technical authorities of the Air Ministry Photographic Section could no doubt provide interesting data on these points, with more authority on the matter than myself.

Messrs. Brock and Holst may be surprised to hear that fully automatic cameras were in use by the Royal Flying Corps in 1915, and that these cameras had a far greater scope than that claimed for the "Brock." The standard film used was 4-inch wide and the photograph 5-inch long. 250 exposures could be made with one loading, and as this could be accomplished in daylight, in the air, the ground covered was practically unlimited. The whole action of the camera was automatic, each photograph registering the height and direction of flight through a separate lens. Timing the exposures could be made at the will of the pilot to suit varying heights and speeds from 0.5 fraction of a second. The power was derived from an air vane with patent speed controlling device and varying methods of suspension were used, from air cushions to gyroscopic gimbal cradles, so that Brock's claim that "no other camera has been built with a system of free suspension" will not stand investigation. As to the designs of the majority of the automatic cameras used during the war by the Royal Flying Corps, I think I can speak with some authority, but I should be glad to see a reply to the article above mentioned from those who informed me that my "automatic cameras were invaluable in the Mesopotamia and Palestine campaigns, where large tracts of land were successfully mapped, without the aid of Brock and Holst.—Yours faithfully,

COLIN M. WILLIAMSON.

23, Denmark Street, Charing Cross Road,
London, W.C.2.

February 25.

AVOIDING DEVELOPER POISONING.

To the Editors.

Gentlemen,—I notice a lot of photographers suffer through metol poisoning. When I started with M.Q. about twenty years ago I suffered in the same way. I liked the developer better than any other, so I put on my thinking cap and the result was I bought a pair of forceps, flat ones. They are difficult to get now—and were then—so I took two brass pressure bars off an old half-plate printing frame and cut them a little, and bolted the ends with two bolts, taking good care to see that the end I was going to use was quite smooth. In making a bromide print, I lift the end of the dish up, put the print in, and flow over the developer. With the forceps I then take hold of the side or corner of the print and turn it over and over until finished, or leave it in the dish, rocking it, until it is finished. I then pick it up with the forceps and put it into a fixing-clearing bath of sulphite, acetic acid, alum, and hypo, keep it moving with another pair of xylonite forceps or a paddle. I do not touch the print with my fingers, and therefore do not have to wash my hands after every print.

After making the trial, I print, say, a dozen and put them one after the other into the developer, each one at the bottom. When finished I take them out with the forceps and carry on as before. Many travellers who have called on me when I have been at work say it is the easiest way of working they have seen, and for a one-man business quite the thing. I even use them for sizes up to 12 x 10, but for a larger size it is necessary to use the fingers, in which case I dip them in water first and take care not to keep them in the developer longer than is necessary. I have never suffered since, and as I do not have to keep washing the hands I am able to turn out a great quantity of work.—Yours faithfully,

A. ENGLAND.

50, High Street, Barnes.

THE WORD "BIOSCOPE."

To the Editors.

Gentlemen,—I am much interested in the "cine-kine" controversy in your pages. I have always been a "cine" man, and admired Mr. Lockett's letter in support of it; but "Kino," whose letter appears on page 90 of your last week's issue, appears to have given "cine" a knock-out blow.

Arising out of the "cine-kine" affair is the word "bioscope," which your correspondent tells us became "an English name in 1894." It may have found its way into the archives of the Patent Office in that year, but the word itself is of an earlier date. It appears, for instance, in the supplementary volume of Knight's "Dictionary of Mechanics," a volume published in 1884—ten years earlier than the date given by your correspondent.

The bioscope of 1884, however, was not the motion-picture instrument we know to-day, but, in a way, closely related to it. It is thus described: "A double vision instrument. In a recent invention of M. Eugène Simmonar, a portrait is shown with the eyes sometimes open, sometimes shut. The illusion of the same person alternately awake and asleep is very perfect. To obtain this effect, the inventor takes a double photograph of a sitter in exactly the same position, only in the first the eyes are open, in the second closed. From these two negatives prints are taken, one on the right side, the other on the reversed side of the same sheet of paper, in such a way that the two images, when viewed by transmitted light, accurately coincide; this can be easily done by the carbon process. By means of a small instrument arranged for the purpose, the light and reversed sides of the paper are alternately illuminated, and the face is seen with the eyes successively open and shut." Thus the bioscope of 1884 is of particular interest.

When the word bioscope was applied to motion pictures of the cinematograph type, or rather a machine for exhibiting them, some of us took it to be a simplification of the word "biophantoscope," the name given to a moving picture instrument introduced by a Mr. J. A. Rudge, of Bath, in, or about, the year 1870. This instrument, which is usually overlooked by historians, was a projection machine on the same principle as the modern instrument, except that the movement was horizontal; a circular band of lantern slides was made to revolve around a stationary lantern.—Yours faithfully,

L. TENNANT WOODS.

Answers to Correspondents.

SPECIAL NOTICE.

In consequence of general reduced supplies of paper, as the result of prohibition of the importation of much wood pulp and grass, a smaller space will be available until further notice for replies to correspondents.

Moreover, we will answer by post if stamped and addressed envelope is enclosed for reply: 5-cent. International Coupon, from readers abroad.

The full questions and answers will be printed only in the case of inquiries of general interest.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

D. H.—Paper ready-coated for the gum-bichromate process is not obtainable.

L. S.—Write to the Registrar of Business Names, 59, Russell Square, London, W.C.1.

F. M.—So far as we know there is no objection whatever to your styling yourself "army photographer."

S. P.—Messrs. Hood and Co., Limited, of Sanbride Works, Middlesbrough, supply bronze memorial tablets.

K. E.—Messrs. W. Butcher and Sons, Limited, Camera House, Farringdon Avenue, E.C., supply fasteners for affixing photographs to mounts.

W. W.—You need be under no apprehension as regards the effect of the mercury-vapour light on your eye-sight. No harm at all will result.

G. W.—There are perhaps a hundred different patterns of between-lens shutters, and the mechanism in each varies more or less. You can surely form some idea by watching your own shutter work.

N. E.—It is a nice point, but we should say that ninety-nine photographers out of a hundred would think there was nothing inconsistent in placing their name on a work produced as you describe.

E. W.—It is very likely that the defect is caused by the impure spirit. We advise trying "pure spirits of wine" from the chemists, which, though a good deal more expensive, should be worth its extra cost.

I. R.—The films are sold to go into ordinary dark-slides with a cardboard backing in the manner of the flat film which was much in use some years ago. If you write to the Kodak Company, Kingsway, London, W.C.2, they will send you every particular.

W. P.—In previous years admission has been by invitation of the Board of Trade only, but there is no reason why you should not apply for tickets to the address as follows:—Board of Trade, (British Industries Fair), 10, Basinghall Street, London, E.C.2.

B. F.—We wish we could oblige you with the information, but unfortunately we have absolutely no data. So far as we know, it is not possible to quote figures which will be in any way a reliable indication of the minimum quantity of developer or hypo which can serve for prints.

C. J.—The firms who buy old negatives for resale of the glass, clean off the films by dipping in a nearly boiling solution of caustic soda. This removes the film almost instantaneously, but it is bad for the glass, and causes, with some types of glass, a matting effect. Another plan, which we believe is free from this objection, is to allow the negatives to soak for some hours in fairly strong nitric acid.

W. E.—Messrs. H. T. Heron and Co., 10-11, Tottenham Street, Tottenham Court Road, London, W.C.2, price 5s. 6d. Mr. W. Heinemann, 21, Bedford Street, W.C., price 6s. The "Modern Bioscope Operator" (Messrs. Ganes, Ltd., 85, Shaftesbury Avenue,

London, W.C.), does not deal with the making and developing of film, but with its projection and illumination and methods of electrical installation.

J. N.—The formula is intended for gelatine ferrotype plates, and for cards coated with a similar emulsion. There are no books on ferrotype photography, and we have no information on the making of positive cards. These goods came for the most part from America, and the knowledge of the emulsions is in the hands, we should say, of only one or two people.

C. A.—(1) Several series of books, the publishers of which we do not know, but you can get them at any good booksellers; also the Medici Society, of Grafton Street, Old Bond Street, London, W. (2) We do not know of any text-book which particularises subjects. (3) We should think anyone who is able to use a saw and hammer could make such a stretcher with very little trouble.

W. D.—(1) The American writer was no doubt referring to an American article. We know of no one in this country who coats what is presumably Japanese vellum with bromide emulsion. (2) We are afraid you will have difficulty in removing the red-ink titles. The only suggestion we can make is that you paint the portion of the negative with a fairly strong solution of hydrochloric acid and then wash well in plenty of water.

E. B.—The arrangement seems quite good so far as the electric light goes—have the light as high as you can manage, certainly 8 ft. from floor, for standing figures, and lower it for sitting ones and children. If the window is only 6 ft. high from the floor, it will be useless for full lengths, but will do for heads. If it goes nearly to the ceiling it will be all right. It is very desirable to have the background easily movable, so that you can get variety in your lighting by moving the sitter and camera to obtain the proper effects.

G. W.—Most lenses in sunk mounts are made so that the diaphragm is rotated by a milled ring on the front of the lens hood, and therefore the latter is not available for the support of a cap or shutter. Such lenses are almost invariably employed with a focal-plane shutter, but no doubt you could get made a fitting which could be attached to the lens partly, and would be fitted forwards clear of the diaphragm ring. It would be clumsy, but still practicable. For a mirror or other fittings for a reflex camera you should apply to a firm of camera repairers, such as Messrs. H. T. Ball and Co., 51, Berwick Street, Oxford Street, W.1.

S. F.—It is impossible to say what weight of hypo is contained in a saturated solution at a given temperature. The solubility of hypo varies so considerably for a degree difference in temperature that such methods of making up a saturated solution are not sufficiently accurate. Our own plan is to dissolve hypo at the rate of 1 oz. per 2 ozs. of solution, that is to say, we dissolve 1 lb. of hypo in hot water and make up to 32 ozs. water. This gives a solution which is sufficiently concentrated, and is easily measured out for making up fixing baths of various strengths, it being necessary simply to reckon two fluid ounces for one ounce of hypo.

S. C.—1. We should think the best book for your purpose is either "Varnish Materials," by J. G. McIntosh, price 10s. 6d., or "Analysis of Resins and Gum Resins," by Dieterich, price 7s. 6d., both published by Scott, Greenwood, 8, Broadway, Ludgate Hill, London, E.C. 2. These questions are rather out of our line, and the only advice we can give you is to apply to Messrs. Johnson and Sons, Ltd., 23, Cross Street, Finsbury, E.C., whom we have found exceedingly efficient in obtaining chemicals of all descriptions. 3. Not so easy to say, but we should think that chloral hydrate, which renders gelatine permanently soluble, could be used with reasonable chances of success.

M. Mc.—The following old method is perhaps what you want:—

Water	160 ozs.
Sugar of lead (lead acetate)	8 ozs.
Hyposulphite of soda	8 ozs.

The solution is used as hot as possible, and the brass work is simply dipped in it, and allowed to remain until black. This takes about a minute or less. The articles are then rinsed in cold water, then in hot water, and dried. If scratch-brushed dry, the black deposit will have a high lustre. When dipped into the solution, the surface of the brass article becomes yellow, then blue, and finally black. The article should not be taken out until all the surface has become blackened. The deposit on it is sulphide of lead. The articles should always be lacquered, otherwise the black deposit is likely to oxidise and fade; but if coated with lacquer,, it seems to be quite permanent.

A. G.—We think you may safely construct the studio on the lines you mention, with one modification, which is, put more glass on the roof. You will then be able to keep your sitter well back and use the light at a considerable slant. If for structural reasons you cannot extend the area of the glass, it would certainly be desirable to raise the whole studio as high as possible, so as to minimise the effect of the outside wall. This wall, by the way, should be lime-washed, so as to reflect as much light as possible. Lime stands the weather better than distemper. We have recently been fitting up a studio with a wall similarly placed, and giving about the same angle of light, and it works quite well. In this case the side windows were stippled with very thin zinc white paint, and this seemed to improve the lighting considerably. With regard to the half-watt lamps, your proposed arrangement is quite good. Have four 1,000 c.p. lamps and a separate switch for each. You can then use only as many as needed. The blind arrangements and wall decorations will be quite right.

J. McD.—A process very similar to yours was patented in Germany in 1912 by E. Rickman. An improved silver-uranium printing paper was obtained by addition to the sensitiser of small proportions of thiocarbamide compounds and of haloid alkaline salts, such as ordinary sodium chloride (common salt) The more of this latter the solution contains, the greater the tendency of the finished print towards a yellowish-brown; the greater the proportion of thiocarbamide, the blacker the prints. The addition of these two substances to the silver-uranium sensitiser renders the paper non-liable to alteration of tone in patches when washing the finished prints. A specimen formula of the sensitiser is as follows :—

Uranium nitrate	25 gms.
Silver nitrate	9 gms.
Thiocarbamide solution, 1 : 20	.5 cc.
Sodium Chloride, 1 : 100	.5 cc.
Water distilled	50 ccs.

This sensitising mixture is applied to papers prepared with starch.

The British Journal of Photography.

IMPORTANT NOTICE.—Advertisers are requested to notice that the prices printed below represent an

Increased Scale of Charges,

which is now in operation in respect to all line announcements.

Since advertisements cannot be inserted until fully and correctly prepaid, senders of line announcements are asked to bear in mind this revised tariff. They will thus save themselves delay in the publication of their announcements.

Net Prepaid Line Advertisements.
Increased Tariff of Charges.

12 words or less	1/-
Extra words	1d. per word.

(No reduction for a series.)

Special Note. Adv'ts under a Box Number.

"Box No." and office address	charged as 6 words.
For forwarding replies add ...	6d. per insertion for each adv't.

If replies are called for this latter charge is not made.

Advertisements cannot be inserted until fully and correctly prepaid.

Orders to repeat an adv't must be accompanied by the advertisement as previously printed.

Advertisements are not accepted over the telephone.

The latest time for receiving small line advertisements is 12 o'clock (noon) on Wednesdays for the current week's issue.

Displayed Adv'ts should reach the Publishers Monday morning.

The insertion of an Advertisement in any definite issue cannot be guaranteed.

HENRY GREENWOOD & CO., Ltd., Publishers,
24, Wellington Street, Strand, LONDON, W.C.2.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3070. Vol. LXVI. FRIDAY, MARCH 7, 1919. Price Twopence.

Contents.

	Page
Ex-Cathedra	109
Reconstruction and Photography	110
Practicus in the Studio. By Practicus	111
Electricity and Photography in Warfare. By H. Moss	113
A New Photographic Survey and Record of London in 1919	114
Death of Mr. H. Essenhigh Corke	115
Assistants' Notes	115
Patent News	116
Meetings of Societies	117
Commercial and Legal Intelligence	117
News and Notes	118
Correspondence— The Assistant Question—Developer Poisoning—"Cinematograph" or "Kinematograph"	119
Answers to Correspondents	120

SUMMARY.

The opportunities for commercial photography, which are foreshadowed in industrial development upon a large scale in this country, are briefly touched upon in a leading article on page 110.

In his article this week, "Practicus" deals with a number of practical points bearing on the heating and ventilation of studios. (P. 111.)

A contributor to the *Electrical Review* describes the use of the portable electric generating station, such as have been largely employed with the armies in the field, and provide a source of electric light for photographic studios situated in country places where neither gas nor current is available. (P. 113.)

An instrument for the measurement of focal length is the subject of a recent patent specification. (P. 116.)

A contributor to "Assistants' Notes" has a number of very well-considered hints to give on the preservation of the eyesight by those engaged in photographic work. (P. 115.)

We regret to announce the death at the age of thirty-five of Mr. H. Essenhigh Corke, of Sevenoaks. (P. 115.)

Major Charles W. Gamble will read a paper on aerial photography at the Optical Society on Thursday in next week. (P. 114.)

A photographic survey of London during the present year is contemplated by the Camera Club. The aims of the scheme are set forth on page 114.

The Lumière method of drying negatives with a saturated solution of potassium carbonate may on occasion usefully replace those employing methylated spirit or formaline. (P. 110.)

The advantageous use which can be made of a vest pocket camera in commercial photography is instanced in a paragraph on page 109. In general the advantage of the vest-pocket camera is the combination of large aperture and depth of focus which it affords.

A couple of suggestions for business other than that of making photographs which might be added to a studio establishment are made in a paragraph on page 110.

"Colour Photography" Supplement.

Particulars are given of a process, patented by Mr. F. E. Ives, of producing colour transparencies from colour sensation negatives, and consisting in the formation of a composite of two-colour positives. (P. 9.)

The necessity of excluding dust from between the screen-plate and the emulsion in the Paget process is the subject of a practical paragraph on page 12, in which it is recommended to bind the two plates temporarily together.

In the present instalment of "Decennia Practica," particulars are given of two pseudo colour processes which in their day had some vogue. (P. 11.)

EX CATHEDRA.

Photographic Survey of London. The communication from the Camera Club, which we print upon another page, sets forth what is truly a very ambitious programme, no less than a comprehensive survey, in the form of photographs, of London at the present time. Until the opportunity occurs of learning, from the booklet which is shortly to appear, the contemplated organisation of the undertaking it is clearly impossible to form an estimate even of its possibilities. But, at any rate, it may be thought that a scheme of which one first hears in March must call for an enormous and well-disciplined body of workers if it is to achieve its end of recording the face of London in the Peace year 1919. At the best of times it is difficult to stimulate an interest in the making of records which are to serve our descendants, and while we cannot too highly value the interest which the Camera Club is showing in this work, we are bound to think that some extraordinary army of photographers will need suddenly to be brought into existence if the aims of the promoters are to be realised.

• • •

The "Vest Pocket" Commercial Operators. There are occasions when a high-grade small camera, far from being a toy, may be of very real service to the photographer placed in exceptional circumstances. The fact that these instruments are fitted with lenses of short focus and wide aperture, and thus give good definition over many varied planes of distance without recourse to stopping down may often be of real service. A case in illustration of this point was told to us some time ago by a commercial worker. He was commissioned to make a series of pictures in a factory, which was rather poorly lighted, of certain pieces of machinery. As the work would have necessitated the use of a lens well stopped down in order to gain the required definition, and as the stoppage of the machinery was an important factor the operator took with him a vest-pocket camera. This he found gave all the definition required, and fine definition without stopping down the lens. The result was that the pictures were taken in a very short time, as the worker was enabled to use the lens working at *f*/6 instead of one stopped down to *f*/22. Enlarged prints were made that gave the customer entire satisfaction. The same operator at a later period had to obtain a view of an old country house in the North of England for an estate agent, and the subject required could only be satisfactorily photographed from a narrow ledge of cliff about a foot or eighteen inches wide. This was obviously impossible with the field camera, but, not to be beaten, the operator took his vest-pocket camera, carefully worked his way to the spot, and then, holding on to a bough with one hand, operated his camera with the other, using the instrument at eye level. The

result was a new and striking picture that had a material value in selling the estate. Though, of course, not to be looked upon as a universal instrument, the modern vest-pocket camera fitted with a good anastigmat will often prove of very real value to the commercial operator when he is faced with difficult subjects. Provided care is given to obtaining a satisfactory negative there is no reason why, with a little working up, the resulting photographs should not be equal, and they may even be superior to contact prints from large negatives.

* * *

Non-photographic Side Lines. From one or two professional photographers during the past few days we have received letters asking for suggestions for other business, within the technical capacity of a studio establishment, which they might take up. While such enterprise has been undertaken, within our knowledge, by one or two photographers, it is difficult to make general suggestions, since very much will depend not only upon individual craftsmanship but upon the local demand for such articles of manufacture as may be produced. However, it may be worth while to mention the instance of a firm of Scottish photographers who have taken up, we believe with considerable success, the designing and making of toys, whilst in Kent is to be found a photographer who has specialised in the manufacture and design of fancy leather goods, such as calendars, and blotters, and whose work, as we have seen it at the British Industries Fair, possesses merit of a high order. It was first shown at the Fair of some two or three years ago, and as the exhibit is included also in this year's Fair it may be supposed that the project has turned out to be profitable.

* * *

Vignetting Bromides. Those who have cause to complain of the hardness of outline of bromide prints exposed in one or other of the customary machines may be glad of one or two hints which, if taken, will go a very great way towards removing a defect of this kind. One is to cut the vignetting card from the corrugated board sold for packing. If the board be cut so as to give a bevel edge to the opening, the corrugations will provide a series of serrations which make for softness in the print. The second hint is to interpose a sheet of fine ground-glass midway between the vignetting card and the negative. Most printing machines will allow of a frame being inserted between the vignetter and the negative, so that the glass can be introduced in the required position without adjustment, and as quickly removed when unvignetted prints are required. The glass, of course, cuts down the light, but in these days when light of almost any power can be obtained from electric lamps this is a matter of small moment.

* * *

Drying Press Negatives. A method of quickly obtaining negatives in a condition for printing and enlarging, which is less known than it deserves to be is that discovered some seven or eight years ago by MM. Lumière. It consists simply in soaking the washed negative for about five minutes in a saturated solution of potassium carbonate. The effect of this treatment, quite contrarily from what might be expected, is to produce a temporary condition of hardness of the gelatine film, permitting of the negative being rubbed dry with a clean, dry cloth, after which it can be immediately printed from or enlarged. The readiness with which a negative is obtained in this state requires to be the subject of trial before it can be appreciated. On taking out of the carbonate solution the film seems to be covered with a film of grease, but is very quickly polished with a cloth. We should not care to keep negatives in this condition if value is attached to them, for obviously, in the case of retention of such a hygroscopic salt as potassium carbonate, the film must remain moist, and such a condition is bound to aggravate any causes of impermanence which may arise from imperfect fixation. Moreover, we have come across plates which showed a tendency to strip from the glass under this treatment, and, therefore, on both accounts the negatives should be washed for a few minutes and dried in the usual way as soon as their immediate purpose has been fulfilled.

RECONSTRUCTION AND PHOTOGRAPHY.

Ever since victory was assured to the Allies the word reconstruction has been upon our lips. Some very wise folk may know what it means when applied to the British Empire, or, perhaps, it would be more accurate to say, the United Kingdom, but to the majority of us it simply means getting back into working order, with better conditions for the workers and upon a firm basis all round. There is, we believe, a general determination to bar the importation of German and Austrian goods into the country, either by legislative or voluntary means, and we trust that our readers will support this action in every way possible, taking care not to be deluded into purchasing goods made by German labour in factories started with German capital in neutral countries.

To supply the needs of this country we shall either have to import from our Allies or make the goods ourselves, and as Germany and Austria dumped vast quantities of finished work upon us, the question is whether the United States and Japan are to reap all the commercial benefits of the war, or whether we shall retain a fair proportion for ourselves. We believe in our manufacturers' resources to attain the second alternative, and this means an enormous stimulus to industry provided that wages are not forced to such a height that it is impossible to make a reasonable profit.

We may, therefore, look for considerable activity in the designing and building of factories, with all the necessary appurtenances of workers' dwellings, railway sidings, canal basins, and the like. With all this activity there must be much work for photographers if they are only alert enough to seek it, and to show that they are properly equipped for its execution. Otherwise the photography will have perforce to be done either by firms from a distance or by the direct employment of an operator who uses apparatus provided by his employers. The average photographer is rather apt to overlook the value of this commercial work, his experience of which is often confined to a few interior and exterior views of factories, with results which from want of practice have not been of the best. If he would realise that it is worth while investing in good and suitable apparatus and to learn how to use it he would soon be amply repaid; in fact, more than once the first job has paid for the camera and lens, and left a handsome balance. The greatest mistake that any business man can make is to sit down and wait for business to come to him, and with the photographer, this is especially so if he wishes to undertake commercial work. Orders for portraits may be secured by a good window show, but orders for factory work must be solicited. Provided that a reliable man can be obtained the photographer can gain much valuable time by employing a canvasser, or, as we should prefer to say, a traveller. Such a man need not be exclusively retained, and it is often easier for a traveller who already calls on a firm for, say, lubricating oils, to broach the subject of photography and secure an inspection of his specimens. Of course, he must be paid, but, as a rule, the greater portion of his remuneration is paid as commission, and is contingent upon orders being obtained.

The great point to be observed when dealing with commercial work is regularity and promptness. If a contract has been made to supply a weekly record of the progress of a building, the operator must be on the spot to the minute on the appointed day, and the prints must be delivered with equal promptness. If these have to be sent to the board of directors in London or Glasgow by the engineer in charge so that payment for work done may be made, no excuses will be accepted if they are not forthcoming, and the result will be the installation of a staff photographer, and the consequent loss of business and prestige to the photographer.

Besides the class of work we have indicated there are many others to be anticipated in the near future. We are told that land surveying will in the future be largely assisted by the employment of aeroplane photographs. The development and enlarging of these should come into the hands of the local photographer, and as more care and exactness are required for these than for ordinary work, remunerative prices should easily be obtained. The reproduction of plans on original, enlarged, or reduced scales, and the photography of complete machines and parts also come into the same category, while the opportunity of securing subjects which can be sold to the newspapers must not be lost sight of. If there is to be a visit of inspection, portraits and groups of interest and value may be secured. Many papers are glad to give a standing order for such pictures to a reputable photographer.

Housing schemes should provide much work, and it should be impressed upon those engaged in them that there is no better selling force than a good photograph of a fairly large size, either in the form of original prints or as half-tone reproductions. It should be impressed upon estate agents or owners that the public will take a good "real" photograph upon trust, while they are apt to be sceptical over gaudy lithographs of proposed "happy homes."

Prices should not be cut too low, but at the same time should be calculated upon a strictly commercial basis, not forgetting to include a proper proportion of rent, rates, and taxes, and other overhead expenses. And it would be well if the district associations of photographers could agree upon a minimum rate for commercial work. In the past, even with cheap plates and paper, such poor prices were often obtained that it was doubtful if any real profit was obtained. We can now withdraw all these old price lists, and on the just plea of increased cost of labour and material issue more satisfactory ones. It is essential that good faith should be observed, and that no secret discounts or allowances be made to secure orders. In fact, let us have reconstruction all round, even in the business morality of photography.

PRACTICUS IN THE STUDIO.

[Previous articles of this series, in which the aim of the writer is to communicate items of a long experience in studio portraiture, have appeared weekly since the beginning of the present year. It is not thought possible to continue the series to the length of that by the same writer which ran through the "British Journal" some years ago, but if any reader among the younger generation of photographers, and particularly those engaged as assistants, has a particular subject which might be dealt with, his or her suggestion will be welcomed. The subjects of the previous articles of the series have been as follows:—

A Talk About Lighting (Jan. 3).
The Camera and the Lens (Jan. 10).
Managing the Sitter (Jan. 24).
Backgrounds (Jan. 24).
Studio Exposures (Jan. 31).
Artificial Lighting (Feb. 7).
Printing Processes for Portraiture (Feb. 14).
Studio Accessories and Furniture (Feb. 21).
The Surroundings of the Studio (Feb. 28).

STUDIO HEATING AND VENTILATION.

The warming and ventilating of studios is a problem which has to be solved in many ways, these being dependent upon the construction, size, and position of the building, and the means of the owner, for it is obvious that what will suffice for the small "portable" type of erection will be inadequate for the large, solidly-built apartments in which the more fortunate among us are able to work. There are, nevertheless, certain general principles which must be observed, no matter what be the size or design, and the owner of the little studio should carefully consider what he can best do with the sum appropriated to the purpose before parting with it. Among these I would put evenness of temperature, cleanliness, freedom from injurious fumes, and economy of fuel, the latter being likely to be more important in the future than it has been in the past.

The position of the heating apparatus should be carefully chosen, as much depends upon it, and, above all, the error usually made by builders of dwelling houses should be avoided—that of placing the stove at the end of the room opposite the door, in which position it creates a draught of cold air and only warms a limited area, giving rise to the complaint that one is frozen on one side and roasted on the other. In warming a studio it is desirable that the stove or radiator should be placed near the door so that the air is warmed in its passage into the room. In studios which have a glass roof—and these are still in the majority—the stove should be placed under the glass, as near to the side light as possible, as not only is this the coldest side by reason of there being only one thickness of glass as a barrier to the outside temperature, but that the warm air ascending to the roof may melt any snow which may fall upon it. I have often known work to be stopped by a thick layer of snow on the glass, and in attempting to remove this by mechanical means the glass may be broken, an unpleasant state of things in midwinter.

With regard to the heating apparatus, there is a wide choice ranging from a boiler and steam or hot water pipes to a portable oil stove, and each has its advantages and drawbacks. On the whole, I have found hot pipes the most satisfactory way of heating, and these, if possible, should be run the whole length of the studio close under the side light, a shelf or flat piece of wood should be placed above them, and the front should be screened with wirework (as ornamental as may be), fixed on frames which can be easily removed when the pipes require attention. This screening hides the unsightly appearance of the pipes and does not interfere with the heating; in fact, the top strip or shelf serves to distribute the warm air more evenly. If the pipes are left exposed they must be painted, and it is important that oil paint should be avoided: not only will it emit an abominable odour when it is heated, but it rapidly darkens and becomes unsightly. Although a dark colour is the better radiator of heat, I consider that on the whole a paint made of finely-ground aluminium in celluloid, which is sold for the purpose, to be the best coating. If any other colour than silver be required to match the walls, a useful paint may be made by grinding powder colours of the desired shade in beer, stout for

preference. I have not tried Government ale for this or any other purpose, but I fear that its adhesive properties would be too poor. This beer colour is used for painting the funnels of steamers, which get rather hotter than the average steam or hot water pipes. It must not be thought that such an installation is a very costly affair if the existing types as used in greenhouses are selected. They may be had in all sizes, and the makers will estimate for the complete outfit if the cubic contents in the studio in feet are given, with the temperature it is desired to obtain. It is necessary to point out that in severe weather the fire must be kept going night and day, not only that the studio may never be allowed to become cold, but to prevent the water freezing and causing fracture of the pipes or an explosion of the boiler.

A useful modification of this system is to have separate radiators, each of which is filled with water heated by an atmospheric gas burner. I know of several studios where they are giving every satisfaction, although a reduction of the gas pressure sometimes lowers the heat to an undesirable extent; to minimise the risk of this the supply pipe should be of ample proportions. A large pipe does not imply a large consumption of gas, but it secures an adequate supply when the pressure is low. When using this or any other system in which gas is burned in the studio, efficient ventilation must be arranged for, or the fumes will cause lassitude and even illness. For small studios one or more of the well-known siphon stoves may be used with advantage. In these there is a large central Argand burner flanked by two metal pipes which not only serve as radiators but condense the products of combustion into a liquid form. These stoves are economical in use and have a cheerful appearance. Two would probably be sufficient for a 20 by 12 studio. Open gas fires are cheerful looking, but rather costly for continuous use; they have also the disadvantage that unless well fenced in there is danger of clothing and drapery being set on fire, a danger which is also present with open coal fires, and one not to be ignored when children are about.

Closed stoves for coal, coke, and anthracite are very useful in the studio, but most of them necessitate either a brick chimney or an unsightly stove pipe. Of this group, those burning anthracite are the most desirable, as once started they will burn continuously for months if supplied with fuel. Thus the studio does not get cold during the night, and there is no trouble of fire laying each morning; all that has to be done is to empty the ashpan occasionally. The older type of slow combustion stove known as the "Tortoise" burns coal, coke, or cinders, and may also be kept continuously burning. Although this may seem wasteful it is really not so, for there is no necessity to make up a big fire every morning to warm the place up in a reasonable time, while the wood, paper, and labour required for lighting are saved.

In certain circumstances oil stoves are the only possible heaters available, and if a good pattern be chosen they are not to be despised. The tall, cylindrical pattern, with a bail handle by which it can be moved about, are very convenient, and if kept clean, is fairly free from the odour of the oil. The Salamander, or blue flame stoves, are very effective, but they are mean looking and cannot be shown in a well-appointed studio. I have, however, used one of these in a fancy cast-iron stove made for gas, and found it quite satisfactory. I have also found that one of these placed under the darkroom sink rapidly raised the room to summer temperature, the sink itself being warm, while the solutions were easily brought to normal temperature by placing the bottles near the lamp. If it be possible, when fitting hot water pipes, to run a bend into the darkroom, it is, of course, better in every way than an independent stove.

From heating the studio to keeping it cool is but a step, and in most people's minds keeping cool and ventilation mean the same thing. This is hardly so, for a studio can be perfectly ventilated and yet kept at a high temperature—it may be filled with foul air at a low one. The essential point in ventilation is to have the outlets and inlets for air properly proportioned and placed in such positions that straight-through currents from one to the other cannot be produced. In single-slant and other studios which approximate to an ordinary room the ventilation can be provided for by opening windows if in convenient positions, or Tobin tubes may be provided as air inlets; as a rule, the inlet should be fairly low and the outlets high. The Tobin tubes, which admit air in such a way that no draught is caused, are of the simplest construction, being nothing more than long, flat boxes of wood or metal, say, ten inches by three, in section, and about four feet in height. They are placed flat against the wall, and at the bottom have an opening to the outer air equal in area to their own inside sectional area, with a protective grating. The top, inside the room, is left open, so that the air on entering has a tendency to rise and becomes evenly distributed. Four such tubes are sufficient for a moderate sized studio. The outlets should be of the ordinary grating type, with mica flaps placed high in the walls, so that there is no accumulation of hot air in the roof. For very hot weather a large flap opening should be provided, as high as possible, at both ends of the studio, so as to permit of a free draught from end to end. It is necessary that the coverings should not permit light to enter above the backgrounds, and this can easily be done by fitting inside louvres after the style of a venetian blind. This is a better arrangement than having a lifting sash or trap-door, as is frequently seen, since the current is more perfect, and there is perfect protection against rain. Of course, there must be a hinged door or shutter inside or outside the louvres. This arrangement is supplementary to the small mica flap ventilators, which are sufficient in cold weather. Small electric fans are very useful for keeping the air in motion in very hot weather, but are not available in many places. The roof of a studio should always be double on the dark side, as this prevents heat from being radiated from the outer roof, which in a north-lighted studio has the full midday sun upon it. In positions where the sun strikes upon the glass it is a good plan to have a long iron pipe, perforated with small holes, running along the entire length of the glass. This is connected with the water supply, so that the glass can be flooded with a gentle stream which quickly evaporates and reduces the inside temperature to a considerable extent. It is also very useful for keeping the glass clean. A flood of cold water is harmful, as if turned suddenly upon hot glass it is liable to make the roof leaky if putty is used for glazing, as it is in the majority of cases.

Much may be done to give an appearance of coolness by the choice of suitable colours for the walls. Green or greenish grey looks much cooler than red or even buff, while ferns, palms, and other plants assist in producing the same impression. One of the most refreshing arrangements I have seen consisted of a passage opening from one end of the studio fitted as a rockery, with ferns and a trickle of water over the stones. Such surroundings produce a tranquil state of mind in the sitter and tend to the success of the portrait. I have also seen a side window opening on to a dingy mews turned into a miniature rockery, with a tiny fountain with goldfish in a lake about two feet across at the bottom. These ideas may not accord with those of the "highbrow" artists of to-day, but they please the average sitter, and that is what we all strive to do.

PRACTICUS.

THE CITY SALE AND EXCHANGE are opening new premises at 105, Cannon Street on Monday next, March 10. Well-equipped darkrooms have been installed, which it is hoped the public will take advantage of.

ELECTRICITY AND PHOTOGRAPHY IN WARFARE.

[The generation of electric current in places where no other source of light is freely available has of course during the active operations in France been an important branch not only of the Royal Air Force but of other sections of the army. Inasmuch as the use of such small installations are equally of interest to photographers in country places, we take the opportunity of reprinting from the "Electrical Review" an article describing the use of such units of equipment. Without an installation of this kind a photographer must fall back either on flashlight or on one of the incandescent paraffin lamps such as the Blanchard, neither of which can be said to rival a portable electric plant for all such portraiture as requires to be done by artificial light.—Eds., "B. J."]

Having recently returned from France, where I have been attached to a photographic section of H.M. Armies, it may be of general interest if I place on record a few particulars of the work of these sections, and the part played by electricity and engineering in carrying out their functions.

It must be clearly understood that these sections are not responsible for the actual taking of the photographs, as this duty falls on the Royal Air Force. The photographs cover quite a large range of subjects—such as front line and support trenches, panoramas of large tracts of country, large mosaics or photographic maps of certain parts of the country, "aerials" of particular spots, enemy gun emplacements, bridges and railways before and after bombardment, roads, etc.

The duty our little party had to perform was to turn out copies of these photographs in large numbers and very quick time, working, when necessary, night and day, to get the work turned out in time to be of service for the particular military operations they were required for—whether it was for operations on a large scale or for local raids or artillery work. To give some idea of the magnitude of the operations these small isolated and almost unknown "sections" of the Army carried out, I may say that work equal to 23,000 full-plate photographs was turned out in 36 hours for one of the big blows dealt at the enemy last August.

Having gone so far to show the extent of the work, we now come to the means of carrying it out, and this is where electricity and engineering played their part "in the game."

As these photographic sections have to move with the armies, the apparatus is often being dismantled, moved, and re-erected, and as the conditions vary with every move, retreating or advancing, the plant is put to work under a variety of conditions; sometimes the generating plant is resting on a few piles driven in the ground, and at other times on a good solid concrete foundation.

The plant I was in touch with consisted of one Gardner 5-H.P. petrol engine, direct-coupled to a 3-kw. Holmes generator running at 500 R.P.M. These machines were, of course, mounted on one bedplate. A second set consisted of a Petter Junior petrol engine, direct-coupled to a 3-kw. Holmes dynamo running at 725 R.P.M., on a common bed-plate.

The working voltage in the depôt was 110, and as a steady light was very essential for the photographic work on account of the time for exposure, for printing, equalising, etc., the supply to the depôt was always taken from accumulators, of which we had two complete batteries, which were used alternately, one being charged whilst the other set was being discharged.

These batteries were generally accommodated in a room or hut near the engine-room, and complete control of the whole installation was obtained by a switchboard in the engine-room, fitted with the usual meters, charge and discharge switches, change-over switches for switching in or out either generator on to either battery, and also for switching either battery on to the works.

All outgoing circuits were controlled by switches and fuses on the main switchboard, and mercury vapour lamps, general lighting and night-light circuits, etc., were all separate.

The batteries were put up in teak boxes, lead-lined, and fitted with lids, and each set had a capacity of 190 ampere-hours. These had a fair amount of rough usage during the various hurried removals, but kept up to their work very well.

As photographic prints of each subject were sent to our works, and not the original negatives, it was necessary to make a fresh negative from each print sent in, and this often meant over 100 subjects per day. These were taken with the aid of Cooper Hewitt mercury vapour lamps, two tubes in series in one frame, and two complete sets being used. In the case of photographs requiring to be enlarged, a Westminster arc lamp and enlarging camera were utilised. All printing from negatives was done in special printing boxes, lighted either by half-

Gardner Petrol Engine.

watt or ordinary M.F. lamps, and the same remark applies to the equalising boxes.

After being printed, developed, fixed, and washed, all prints were hung up in a drying-room heated by slow-combustion stoves and spirit flares, and the air was kept moving with two 12-in. electric fans. As the temperature in this room was generally about 120 degs., the prints were dry and ready for the cutters in a very few minutes.

The water supply was generally obtained from a stream near which the works were always situated, and the water pumped up to a supply tank with a Pelapone pumping set consisting of a petrol engine driving a turbine pump by means of a V-shaped belt, the set being mounted on a wooden frame, and so arranged that when the pipes were disconnected, it could be picked up bodily and carried. The water supply tank was generally fixed on a wooden structure near the main shed or building, and the water supply to all the washing sinks was run in screwed iron pipes, although a quantity of hose pipe was used for connecting up to the pump and tank at various

times. The quantity of water used would be about 2,000 gallons per day.

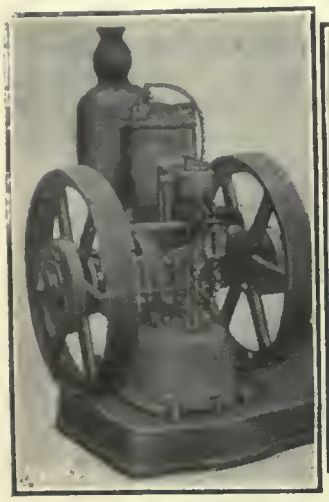
Floats and indicators were used in and connected to the supply tank, and arranged with electrical contacts either to ring a bell or switch on a coloured light when the tank was either full or empty.

The general lighting of the depôt, which consisted of dark rooms, cutting-room, stores, office, engine, battery and pump rooms, dining room, billets, etc., was carried out with ordinary M.F. lamps, and the general wiring was carried out on the cleat system, this enabling dismantling and re-erecting to be carried out in a very short time; I have known the plant to be dismantled and taken across country thirty or forty miles, photographic work being resumed in something like 48 hours. This, of course, was with a good deal of very temporary work, but the "military machine" had to be kept going, and the work of making a fairly decent job of the general installation had to be done whilst the place was kept working; very often, as soon as it was a bit straight, another move would be ordered. However, as the production of these photographs in an efficient and quick manner very often meant the saving of thousands of valuable British lives and the destruction of those of the enemy, everybody worked with a will for a definite purpose.

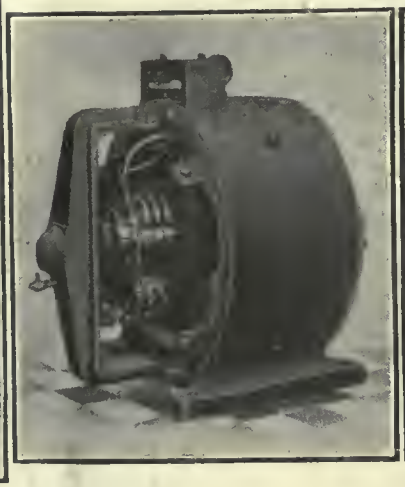
The engineering staff consisted of another R.E. and myself, and the total works staff only amounted to 25, including officer, N.C.O.'s, engineers, dispatch rider, cook, storekeeper, and photographers.

The illustrations show some of the plant as used and described, and I might also add that the switch used for the firing of the mines at Messines Ridge eventually found its way on to our switchboard.

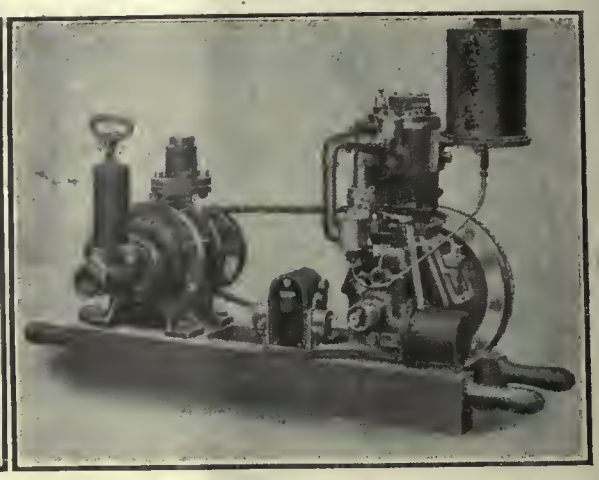
Such is a short account of one of the many cases where engineering and electricity, in particular, have come to the aid of our Armies, and have been used to advantage in helping to beat the Hun and save civilisation from a fate that was too horrible to contemplate. H. Moss.



Petter Junior petrol engine.



Holmes dynamo.



Pelapone pumping set.

Lancashire Society of Master Photographers.—A committee meeting of the above society will be held on Tuesday, March 11, at 4 p.m., at the Manchester Chess Club, 65, Market Street, Manchester.

The Optical Society.—At the meeting to be held on Thursday next, March 13, at the Imperial College of Science, South Kensington, S.W.7, a paper on "Some Photographic Apparatus Used in Aerial Photography" will be read by Major Charles W. Gamble, R.A.F. Any of those interested in the methods of aerial photography will be made welcome to the meeting.

A NEW PHOTOGRAPHIC SURVEY AND RECORD OF LONDON IN 1919.

The remarkable manner in which familiar aspects, streets, and buildings in London have changed in recent years must be apparent to every Londoner who has been away from the city for even the duration of the war.

During the period of the war in particular, temporary buildings have sprung up on all sides to alter still further the appearance of well-known spots. It is satisfactory to know, therefore, that the Camera Club has undertaken the organisation and direction of a photographic survey of London in the "Peace Year" 1919.

The object of the scheme is to provide a complete photographic record of the appearance of London in the present year, such a record to comprise not only photographs of buildings and monuments of historical interest, but also as many as possible of the ordinary sites and streets of which so little memory remains after frequent rebuildings. It is only necessary for a man of middle age to attempt to recall the London of his youth for the value of this scheme to become apparent.

According to the main outlines of the idea the London area will be divided into sub-areas, in each of which a local secretary will be appointed, and, if possible, a local sub-committee to organise the work; and an appeal is being made in the first instance to London and suburban photographic societies to assist. At the same time, individual workers in every quarter will be welcomed, and arrangements will be made for them to get into touch with local centres, as it is hoped that many of the workers in each area will be local residents. If such a record can be adequately completed (and there is no reason why it should not be, if sufficient help is forthcoming), it should be of enormous value and interest to posterity.

No such complete photographic record has yet been attempted on the lines suggested by the Camera Club. Photographic surveys of London have certainly occupied the attention of many bodies in the past, but in most instances they have been confined to specific series of buildings, etc., of either historical or archæological interest, or, as in the case of the London Survey, have only dealt with buildings preceding a certain date.

The Camera Club Photographic Survey of London will, however, aim at a much more complete record of the appearance of the Capital in 1919. It is desired to secure photographs of practically every street and building in London and Greater London as it exists at the present day, and even more attention will be given to the ephemeral buildings associated with the war, and which will probably not be in existence next year, than to greater monuments of historical antiquity which will appear much the same in a hundred years' time as they did a century ago. At the same time, these will not be overlooked. The presence of figures in the costume of the moment will not be regarded as detrimental to the record where they occur. The pictorial quality of the prints will, however, be of secondary importance to their value as technically good results.

To carry out the scheme successfully and completely the Camera Club will shortly be making an appeal in the public press to raise a small fund of, say, £100 to meet postage and initial office expenses, as the conduct of the details will involve this amount at least in addition to a considerable amount of time and labour. But the ultimate success of the scheme depends upon the support of the great body of amateur photographers of all ages and classes who are in London and Greater London to-day. It is suggested that all prints shall be of a standard size, and half-plate has been mentioned as the most suitable. These should be made on bromide paper, as it is considered that a well-made, thoroughly fixed and washed bromide print is probably as permanent as a print in any other process.

Standard large-scale sectional maps of London will be provided for each secretary of the photographic societies or other organiser of local groups of workers. The exact situation of the subject recorded and the position from which the picture was taken are to be marked on these maps, with suitable references to the print itself.

Until the survey is complete the Camera Club is undertaking to mount, file, and store the prints, which will be treated in a uniform manner and systematised for reference. The collection will eventually be stored in one of the public museums.

A leaflet describing in detail the whole undertaking is in the press, and will be forwarded to anyone interested who sends a stamped addressed envelope to the Hon. Secretary, Photographic Survey of London, Camera Club, 17, John Street, Adelphi, London, W.C.

DEATH OF MR. H. ESSENHIGH CORKE.

We regret to announce the death, on Monday of last week, February 24, from influenza followed by pneumonia, of Mr. H. Essenhigh Corke, of Sevenoaks, one of the best-known professional photographers of the younger generation. For many years Mr. Corke, in succession to his father, had carried on the business of a photographer on the main street of the pleasant Kentish town. But his work in several directions obtained for him much more than a local reputation. He was a prominent exhibitor at the exhibitions of the Royal Photographic Society and the London Salon, where his essays in pictorial figure work were notable for their artistic and technical quality, and afforded promise of still finer work of this kind. He was also an enthusiastic and very successful photographer of flowers, not merely in monochrome but in the Autochrome process. His work in this field represents some of the finest Autochrome colour transparencies which have been made, and was in great demand for the illustration of books on horticulture. Taking an amateur's interest in his business, Mr. Corke was a frequent contributor to the photographic Press both in this country and in America, and his papers published in this way during the past ten or fifteen years contain the descriptions of many working methods originating from his own practice. Perhaps none of these has been more widely adopted than that for the making in the studio of portraits giving the effect of having been taken by firelight. Mr. Corke worked out this idea very thoroughly, and the first description of his method appeared some years ago in our pages. The photographic profession is the poorer for the loss at the early age of thirty-five of one who took a very real interest in its technical and artistic development. It may be added that the business will be carried on by the deceased's sister, with the assistance of a former very capable assistant, who has just returned from a prisoners' camp in Germany.

Repairs to Shew Cameras.—Mr. H. T. Ball, who for seventeen years was with Messrs. J. F. Shew and Co., informs us that the firm of Staley, Shew, and Co., having given up business, he is prepared to undertake repairs of any description to reflex, Xit, and others of the Shew cameras. Mr. Ball, whose competency in the making and repair of apparatus we know from our own experience, has his workshops at 51, Berwick Street, London, W.1.

Assistants' Notes.

Sight and the Photographer.

It goes without saying that sight is the most important bodily function from a photographic point of view. One might imagine an armless, legless, deaf or dumb person performing some job or other connected with the business, and even one with deficiency of intellect might possess some little photographic skill, but a blind photographer is impossible.

It follows that a photographer's eyes, good or bad, should not be neglected, but accorded at least a modicum of intelligent consideration. A good many pros. hold the belief that the practice of their craft is in itself sufficient ultimately to damage the sight, and judging by the number of workers one meets whose eyes are not so good as they might be, the belief seems reasonable. On the other hand, there are craftsmen of ripe age whose sight is still perfect in spite of years of hard work. The fact is that photography *can*—not must—damage or even destroy the sight of anyone engaged at it, the damage usually being brought about by circumstances many of which are in themselves inconspicuous and therefore unsuspected.

These circumstances depend on the nature of the work, each branch of the business having its own peculiar sources of possible eye strain. In the studio the eye may suffer from constant straining at a too thick or coarse focussing screen, or focussing with the lens stopped down. This is a small thing, but in a very busy shop where the operator may be behind the camera for hours at a stretch, the strain will tell. Where much focussing has to be done, as much light as possible should be allowed through lens and screen, and the work done smartly. Indecision causes strain, and does not improve the final definition of the picture.

The continual switching from short to long focus, occasioned by looking first at the sitter and then at the screen, may tire an eye that is weak, but if the eyes (and the general health also) are strong, this should prove more of an exercise than a strain.

Working with artificial light, an operator may damage his sight by allowing the light to fall directly on his face too often; in other words, by looking long or often at the lamp. Continual switching on and off from full light to semi-darkness, as also going in and out between studio and plate-changing room, will leave its mark on the sight if carried on to a great extent. The moral here is to keep a fair amount of light in the studio all the time, and have an assistant changing. The latter can keep his or her gaze away from the bright end of the studio without any trouble.

In the dark-room the red or yellow lamp is often blamed for tired or failing eyes. This is not strictly right, though the position and strength of the coloured light is very often to blame. A lamp should never be in a position to send direct light into the eye when working, and for this reason a hanging lamp, shedding all its light downwards, is to be recommended. The strength of the light should be as great as the sensitive materials will permit. With regard to the printing room, I would say to those who can please themselves: Discard bromide for gaslight, have as much light as you would in your drawing-room, and be comfortable.

Where yellow or red light is compulsory all walls should be painted very light; it will obviate much eyestrain in groping about for things which are invisible.

With printing and retouching direct light is mostly used, but in neither case does it—so far as my experience and observation go—hurt the eye to the same extent as in the case of the dark-room lamp. The difference is this: in one case the eye is working with the image supplied by the direct light and nothing else, in the other the direct rays are worrying the eye and distracting it from its work. This can continue for a long time without the victim being aware of it, even though the eyes and the work may be suffering.

For retouching, the use of direct light, however, is not compulsory; many workers prefer to work against a white or tinted reflector, and one retoucher I know claims that this practice is responsible for his sight being as good as it was twenty years ago. Retouching with weak light, particularly if the negative is yellow or dense causes eye strain, while the remarks on dark-room lamps

apply also to extraneous light near a retouching desk. Working on very small heads is apt to be trying, and for this a magnifier may lessen the strain, but it should not be used habitually, otherwise it may become an indispensable crutch.

Spotting and working-up require sight that is perfectly free from astigmatism, and when done by anyone whose sight is not normal, and not corrected by glasses, this work will greatly aggravate the weakness. At the slightest sign of strain the lighting conditions should be examined, and if not at fault astigmatism should be suspected and the eyes tested. Spectacles, however, are not likely to cure bad sight; they will correct the vision and so do away with strain, but that is all.

Before going any further it may be as well to say that this article does not pretend to deal with its subject from any but a purely photographic standpoint. The many defects of vision caused by such things as nerves, bad blood, cigarettes, etc., are not within my scope, and when a photographer's eyes give trouble it rests with him or his doctor to decide whether his craft is to blame or not; it is always possible that some outside influence is causing the mischief. At the same time, a few remarks on the care of the sight may not be out of place. Tired or overworked eyes can be benefited by bathing, and any chemist will make up an eye-bath cheaply. The simplest and safest of these is boric acid.

Sight can be greatly improved by country walking, particularly in districts where long clear views prevail. In my own experience I find nothing to equal daily gazing at landscape the foreground of which is mostly green, with distant planes stretching to far off mountains. Unfortunately, we cannot always enjoy this kind of cure for tired eyes, but in any case and at all times it pays a photographer to care for his eyes, even if it means a little extra trouble. This applies particularly to young workers. In the vigour of youth details are not so readily noticed as they are in after years, and a young enthusiast may go on working in conditions which are bad for the sight without worrying until the mischief is done. Years after it may cost a good deal to undo what a little forethought could have prevented.—THERMIT.

Patent News.

COMPLETE SPECIFICATIONS ACCEPTED.

These specifications are obtainable, price 6d. each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

MEASURING FOCAL LENGTH.—No. 120,984 (November 30, 1917). The invention relates to an apparatus for measuring the focal length of lenses, whether spherical, cylindrical or prismatic or of any combination of such forms, and for indicating the optical centre, the axis of the cylinder of a cylindrical lens or the position of the base of the prism of a prismatic lens.

The invention consists in an apparatus comprising certain essential parts defined by the appended claims.

Fig. 1 of the accompanying drawings is a vertical section of an apparatus according to the invention. Fig. 2 is a view showing the hair lines hereinafter referred to.

The apparatus shown comprises a telescope, 1, provided with an eye-piece attachment fitted with an eye-lens, 3, and a field lens, 3^1, beyond which latter are cross-hair lines, 2, one of which is graduated, the eye-piece attachment being telescopically adjustable to bring the hair lines into the focus of the optical system constituted by the lenses, 3 and 3^1.

The hair lines are carried by a tube, 2^1, rotatable around an axis coincident with the axis of the telescope, 1, and carrying a head, 2^a, provided with a graduated scale.

Disposed in the optical axis of the telescope, 1, is an auxiliary lens, 4, in the principal focus of which is clamped the lens, 5, to be measured or tested.

The clamp employed comprises four spring-pressed gripping pins (of which two are shown at 5^1) in which the lens may be securely held in central position, there being no adjustment or movement of the clamp during the test.

Mounted so as to be slidable towards and away from the lens, 4, is a tubular fitting, 6, in which are received a small electric lamp, 7, or other means of illumination, a diaphragm, 8, or the like having a central pinhole aperture disposed between the lens, 4, and the lamp, 7, and a very short focus lens or globule, 9. between the diaphragm, 8, and the lens, 4, the short focus lens or globule, 9, being adapted to produce a greatly reduced image of the aperture of the diaphragm, 8.

The tubular fitting, 6, is movable along the optical axis of the telescope by means of a rack, 10, and pinion, 11, or other mechanism. For indicating the extent of movement, there is fitted to rotate with the pinion, 11, a disc, 12, provided with graduations, the scale divisions being preferably in diopters.

Assume that the lens to be measured is a simple spherical lens. The lens, 5, having been clamped in position, the tubular fitting, 6, is moved axially until a sharply defined image of the aperture is seen by the observer looking into the eye-lens, 3. If the

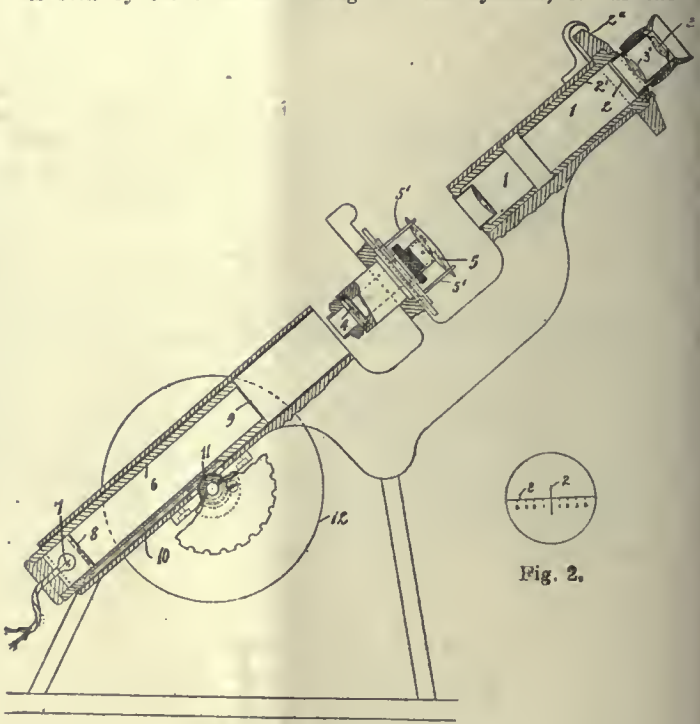


Fig. 2.

Fig. 1.

lens, 5, be correctly centred, this image is at the point of intersection of the hair lines. The focus or foci of the lens, 5, is simply read on the diopter scale on the disc, 12.

If the lens, 5, be decentred or prismatic, the image of the aperture will be offset from the said point of intersection of the hair lines. The tube, 2^1, is then rotated until the image is bisected by the graduated hair line. The distance of the point of intersection of the two hair lines from the point of bisection of the image is a measure of the amount of decentering or of prismatic power. The reading on the scale on the head, 2^a, which denotes the extent of rotational movement of the hair lines is a measure of the position of the base of the prism.

If the lens, 5, to be measured by cylindrical, the image of the aperture is a line of light. To ascertain the position of the axis of the cylinder, the tube, 2^1, is rotated until the graduated hair line is seen in coincidence with or parallel to the line of light; the extent of rotational movement of the tube, 2^1, as indicated on the scale on the head, 2^a, being a measure of the angular relation of the cylinder axis to the lens. John Trotter, 40, Gordon Street, Glasgow.

MR. WM. HAIG PARRY, of Middlesbrough, having been recently demobilised from the Royal Air Force, has dissolved partnership with his sisters, and is now commencing business on his own account at 14, Cargo Fleet Road, Middlesbrough, as an engineering, shipping, and commercial photographer.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

SATURDAY, MARCH 8.

Edinburgh Photographic Society. Exhibition Lecture.
Rodley and District Photographic Society. Social Evening.

SUNDAY, MARCH 9.

United Stereoscopic Society. "Oxford." Dr. A. H. Robinson.

MONDAY, MARCH 10.

Bradford Photographic Society. Demonstration. "Lantern Slide Making." C. F. Lawson.
City of London and Cripplegate Photographic Society. Demonstration. B. C. Wilkinson.
Dewsbury Photographic Society. "After-work on Bromides." A. T. Dawson.

TUESDAY, MARCH 11.

Royal Photographic Society. "Improvements in Lenses for Aerial Photography." W. B. Appleton.
Quekett Microscopical Society (Photographic Section). Lecterettes. Members.
Sydney Photographic Society. Members Annual Sale.

WEDNESDAY, MARCH 12.

Croydon Camera Club. Annual Rummage Sale. Auctioneer, S. G. Klitz.
Ilford Photographic Society. Open Night.
Birmingham Photographic Association. Visit from Partick Club.
Photographic Society. Members' Evening.

THURSDAY, MARCH 13.

Liverpool Amateur Photographic Association. "The Story of Venice." S. L. Coulthurst.
Brighouse Photographic Society. "Life of a Spider." W. Cliff.
Hammersmith (Hampshire House) Photographic Society. "One Man Show." Dr. C. A. Swan.
Hull Photographic Society. "The Castles of the Loire." Rev. W. Hay Fen, M.A.
Rodley and District Photographic Society. "Ozobrome." Mr. Vause.
Chemical Photographic Society. "Wanderings in Chile." Mrs. Mary Grant.
Richmond Camera Club. "Azure Coast." W. Sanderson.

ROYAL PHOTOGRAPHIC SOCIETY.

HOLDEN on Tuesday, March 4, Mr. J. C. Warburg in the chair.

A paper on "Hints and Suggestion for Use in the Dark-Room and Workroom," by Mr. Vivian Jobling, disclosed the author to be the possessor of an immense amount of ingenuity and imagination in the design and construction of various little contrivances for dark-room work. It would be impossible to mention all the hints which Mr. Jobling gave, but a few may be singled out. For rendering the work bench impervious to liquids, he treated it with paraffin wax, forcing the wax into the pores of the wood by means of a hot laundry iron. In order to obviate the formation of air bells on negatives, as a result of mixing the developer with aerated water from the tap, he kept a few bottles of boiled water on the dark-room shelf, fitting these with two glass tubes (one of small diameter) passed through a cork: the water could be readily poured from the larger tube, air entering through the smaller. When leaving bottles after use, Mr. Jobling placed cardboard caps over them, so as to prevent dust from settling on the rims. A method of making up 50 per cent. hypo solution without weighing consisted in taking a pint bottle and, after filling it with water and then pouring out half an oz., making a mark at the level of the water. If then hypo be added until the solution fills the bottle, a 50 per cent. solution will result, 20 ozs. of hypo increasing the bulk of the water in which it is dissolved by 1"; etc.

Mr. Jobling described some very neat plate separators made for the development of a number of small plates in a large dish. One pattern of these consisted of a thin metal cross, each arm of the cross being cut half way through, and then turned up at right angles with the original plane of the metal. Other separators consisted of thin wax paper, perforated in places with a half-round chisel, and the perforated semi-circular portion turned up at right angles. It was found that by making these upstanding half-moons all in the same direction that an even flow of developer was obtained, and there were no wave markings on the plates, as was the case when the flow of developer was obstructed by a part of the separator. Another little device of Mr. Jobling's consisted in L-shaped pieces of thin black paper for the masking of lantern slides. Mr. Jobling preferred these better to the single masking pieces, since the squareness of two adjacent sides was determined beforehand when cutting the pieces by the aid of a template. A final hint related to the cutting down of glass for use as lantern slide cover-glasses, and Mr. Jobling showed a very ingenious device for cutting plates of vest pocket size from five by four.

After some brief discussion, in which the Rev. F. C. Lambert, Mr. H. C. Weston, Lieut. Jennings and others took part, the hearty thanks of the meeting were accorded to the lecturer.

CROYDON CAMERA CLUB.

SOMEBODY has somewhere said that when any particular art becomes largely talked about it is decadent and dying. If this be true, then photographic pictorialism must be in a bad way. In another aspect, much modern work can be considered to be habitually dying if it is deemed to be synonymous with the art of the camera. At Croydon during the last six months the so-called ethics of picture-making have been dealt with many times by various teachers and lecturers. In the main this science of artistic duty, as expounded, has been based on the broad principle of burying a more or less despised photographic image with powder or paint, and holding a sort of wild Irish wake while it slowly gives up the ghost.

If the operator does not happen to be a trained artist, delirium usually follows the departure of sanity, but, after all, delirium is a creation, the other emphatically is not—"art" *versus* piffling "selection," so to speak. It is this buoyant feature which enables the artist, elevated purely by the process, to float serenely about those who stick to earth, and what they consider to be inherent limitations of the craft. If only the former style of art had anything tangible to grasp, a neck, for instance, assuredly by this time its face would be blacker than blacklead, if certain sorely-tried members had had the pleasure of meeting it on the level.

Last week, Mr. T. H. B. Scott pluckily turned up, looking and feeling none the better for a recent bout of the "flue," to chat about a collection of his own landscapes, and very good indeed and pleasant to gaze upon they were. Half-tone illustrations from pictures by other workers were also included, all nicely mounted on white blotting-paper.

The combined collection represented a part of the output of the East Anglian Photographic Federation, which, he said, was striving to follow the famous Norwich school of landscape painters by incorporating with landscapes a feeling of air and space, a definite aim tending to produce better things than desultory and haphazard work. The influence of this school, and the work of "Old Chrome" and Constable on British and French landscape art, was then briefly sketched. As regards criticism, that of the destructive kind, anxious and eager to find fault, was as easy in its inception as it was injurious in its application. One should endeavour to criticise sympathetically, and, so far as possible, appreciatively.

The rest of Mr. Scott's remarks consisted chiefly of well-balanced criticism of the exhibits on the walls. In one respect they fell far short of what one had a right to expect. Almost invariably the photographic artist towers above the painter or draughtsman when it comes to a generous recognition of his own genius. Too frequently the painter diminishes the appeal of a picture by openly stating he regards it as but a stepping-stone to bigger things; and Mr. Scott seemed inclined to follow this example. Having now been warned, it is hoped he will be more careful. By all means let him talk confidently about the future, but only in terms of relative greatness. The traditions of the art must be maintained.

A most hearty vote of thanks, and a drop of something (the last of the Mohicans) to keep the cold out on the journey home, were accorded the lecturer, who was much appreciated by an infuriated audience, one goaded to this state by an enforced consumption of ginger-ale or Croydon water. And such ginger-ale! The pretty things that were said about the powers that be would lose all virtue if paraphrased. Failing instant departmental action, it is understood that Mr. Harper in full art-paint will be dispatched to Westminster, with reflex camera and fitted gramophone horn sky-shade in skirmishing formation. These, with filters, telephoto lenses, changing-bags, tripod, and other essentials distributed about his person, impart an aspect sufficiently terrifying to bring any Government to its knees.

Commercial & Legal Intelligence.

SHOPS ACT.—At the City Police Court, York, last week, Thomas J. Hanstock, of 11, Clarence Street, photographer, was summoned for having kept his shop open during prohibited hours on February 19. The Chief Constable stated that the defendant had contravened the Shops Act by keeping open on Wednesday afternoons when he should have closed. Sergeant J. Croft spoke to visiting the defendant's shop on Wednesday, February 19. It was open. He asked the defendant if he closed the shop for a half-day during the week

and the reply was that he did not close. The shop was kept open for the convenience of the customers on Wednesday afternoons. The Chief Constable said that photography was not a trade exempted from the Order. Defendant handed to the magistrates a copy of a regulation made by the York City Council under the Order by which "fancy postcard and photograph dealers and toy dealers" were exempted from its provisions. The Chief Constable maintained that defendant was not a "photograph dealer," but a photographer. Mr. Miles: Your contention is that the regulation only applies to persons who sell postcards or photographs, and not to people who take orders for photographs? The Chief Constable: Yes. Photographers have never made any application to be exempt. Defendant said he was a photograph dealer and manufacturer, as well as a photographer. He only kept open on Wednesdays because hundreds of people had been diligently working overtime during the war and had only Wednesday afternoons off. It had not been his intention to do so much work, but he felt that he ought to oblige poor people who wanted to send photographs to their husbands at the front. He had frequently worked without stopping for dinner, not for greed of money, but because he wanted to console these people. He admitted that other photographers in the city closed on Wednesday afternoons. The chairman said a fine of 7s. 6d. would be imposed. Unless the order was obeyed by the defendant he would have a monopoly of taking photographs on Wednesday afternoons, which was not fair to the others. There was, perhaps, some excuse from the defendant's point of view. Defendant said he did not intend to keep open on Wednesday afternoons, but he asked the Bench to bear in mind that under the order there was nothing to prevent him or any other photographer from taking photographs by appointment on Wednesday afternoons.

Fraud in Oil Portraits.—A canvasser of portraits in oils, named Armin Gross, was last week sentenced to six months' hard labour at the Maidstone Assizes. The circumstances of the case had previously been heard before the Bromley magistrates, when Gross (41), described as a portrait specialist, of 6, Plympton Road, London, N.W., was charged with obtaining £50 by alleged false pretences from Mrs. E. J. Armstrong, at Chislehurst, between February 1, 1918, and April 25, 1918; and Gertrude Green, of 33, St. James Square, Holland Park, London, was summoned for aiding and abetting in the commission of the alleged offence. About the end of January, 1918, Mrs. Armstrong, a widow, who was staying at Cranmore Place, Chislehurst, was visited first by the female defendant, who spoke about helping British artists, and said they were in a bad way owing to the war. She said she was travelling in that district to get orders to help support them. She showed Mrs. Armstrong some miniature samples, and Mrs. Armstrong decided to have a miniature painting of her late son, a lieutenant in the Sherwood Foresters, who was killed. The price agreed upon was 10 guineas, and Mrs. Armstrong understood that it was done to help artists distressed through the war. Later the male defendant appeared at Chislehurst. He brought a small crayon drawing for the miniature and carried on the idea of charitable help for distressed artists. He produced for her inspection a partly finished portrait of the late Sir Stanley Maude, and said it was an order he had received from the family. He asked Mrs. Armstrong if she would like a picture of her son done by the same artist, and said the price of a painting similar to the one produced would be £50. He represented that it was "frightfully" cheap, and that the usual price charged by this artist, who was impoverished by the war, was 150 guineas. He, however, said he would get it done for 50 guineas, and having been told that it would be done by a poor artist, Mrs. Armstrong was influenced to give an order for a portrait to be done. She believed it would be a charitable action, and that she was getting the painting very cheap. About a week later the male defendant called with the finished miniature ordered through Mrs. Green. Mrs. Armstrong said she didn't like it, and had another one. On February 12, Mrs. Armstrong gave him a cheque for £63, for which he gave her a receipt, with an intimation that 10 per cent. of the money would be given to any charitable institution she cared to select, and she chose the Lord Roberts' Workshops' Fund. On April 23 Gross called with a man named Butler, who said he was the artist. The painting was produced. Mrs. Armstrong said she did not like it. Gross said he was sorry, and the picture was taken away and altered. On April 25 Mrs. Armstrong received a letter from Gross in the following terms:—

"I am pleased to say that the oil painting is now quite ready. The alteration on the cheek and mouth has turned out most successfully. The artist has been working on it ever since he brought it back. I ordered a case to pack it in, which will be ready in ten days' time. The cost in all for packing, carriage, and insurance will be £1 5s. I have gone to considerable expense in pleasing you, and as I have every confidence in the artist who painted the picture, and with whom I have an agreement by the year, I was more sure of him pleasing you than anyone else. I pay him £5 a week and give him three commissions per year, which works out at £87 per painting. I sincerely hope you will see that I am nothing in pocket, at least that I shall not be the loser. I feel you did not mind whatever the cost if it pleased you . . . I am enclosing an account of actual money I laid out, and leave it entirely to you to do what you think is right."

The account enclosed with the letter was as follows:—

One oil painting	£87	0	0
One miniature	8	8	0
One miniature	8	8	0
One black and white portrait	6	6	0
One miniature case	4	10	6
One small gilt frame for second miniature	1	1	0
One frame black and white	0	12	6
One frame for oil painting	4	10	0
Packing case, insurance, etc.	1	5	0
	£122	1	0

Mrs. Armstrong then wrote to Gross, referring him to her solicitors, and subsequently Gross wrote in reply as follows:—

"The painting will be despatched to-day. I was more than surprised at your letter. I certainly will not take any action, as what I did was entirely on my own risk in doing my best for you. Surely you quite understand that it is an extra expense doing a larger painting, also a large frame. However, if you think I am not entitled to any more we will leave it at that, only I will never in future do for anyone more than first arranged. In any case I shall be glad to know if you are entirely pleased."

Frank Richard Webb, manager to John B. Smith, of 117, Hampstead Road, London, said he supplied portrait frames similar to the one produced to the prisoner Gross. The present-day price was about 20s.; the pre-war price was 11s. 3d.

Ottywell Butler, of 45, Canonbury Square, London, an artist, said he painted the portrait produced on an order from Gross. Witness was paid about £3 for it. Witness painted it from the photograph produced. He had never received £150 for a picture from anyone, and the utmost he had received from the prisoner Gross for a picture was about £10. On a few occasions witness had received as much as 40 guineas for a picture from life, after a series of sittings. For a picture of the size of the painting produced witness was usually paid £2 or £2 10s.

Mr. Justice Horridge did not think the charge of obtaining money by false pretences could be sustained as the indictment was not properly framed, and the jury found prisoner guilty on the second count of endeavouring to obtain money by false pretences.

It was stated that there had been a good many complaints about prisoner, who was sentenced to six months' hard labour.

News and Notes.

Messrs. Rajar, Limited, are issuing a new printing paper, "Raje," for which they claim "gaslight quality" as regards the blacks and "bromide quality" as regards the gradation.

Lancashire Society of Master Photographers.—The first dinner arranged by the society was held at the "Albion" Hotel, Piccadilly, Manchester, on Tuesday, February 25, and was in every respect a huge success. The number that sat down was fifty-seven, the accommodation being fully taxed. A most enjoyable evening was spent. The president, Mr. N. S. Kay, presided, and the important duties of M.C. were in the most capable hands of Mr. F. Kenworthy. The musical programme was contributed to by Madame Alice Sampson, Miss M. Phillpott, Mr. Ryder Boye, Mr. F. Kenworthy, Mr. N. S. Kay, Councillor Saronie, Mr. F. Mills, Mr. F. Turner, and Mr. W. Dunkerley, who accompanied in a most able and efficient manner.

Mr. Marsden Jackson, tenor, of Manchester, was unavoidably prevented from contributing to the musical programme owing to the prevailing epidemic. An excellent menu had been prepared, and full justice was done to the same. The toast of the P.P.A. was responded to by Mr. Chidley, of Chester, in a very able manner, and his speech was very well received by those present. The society is holding an exhibition of members' work in Blackpool on Tuesday, May 27, and following days, and it is hoped that every member will make a note of the date, as the annual general meeting and election of officers will also take place on May 27. Fuller particulars will be announced in due course. Applications for membership should be addressed to the Hon. Sec., Mr. F. Read, 14, Balfour Road, Southport.

British Scientific Products Exhibition, 1919.—The King has graciously consented to act as president of the British Scientific Products Exhibition, 1919, which will be held at the Central Hall, Westminster, during the month of July. The president of the Exhibition is the Marquess of Crewe, K.G., and Professor R. A. Gregory is chairman of the organising committee.

The British Science Guild has been encouraged to organise this exhibition by the success which attended that held at King's College last summer, and the more recent exhibition at Manchester. Now that many inventions can be shown which could not be put before the public during the war, there is every prospect that this year's exhibition will be even more successful than its predecessors. The objects of the exhibition will be to illustrate recent progress in British science and invention and to help the establishment and development of new British industries. Such an exhibition will enable new appliances and devices to be displayed before a large public and will provide progressive manufacturers with an opportunity of examining inventions likely to be of service to them, thus serving as a kind of clearing-house for inventors and manufacturers, as well as illustrating developments in science and industry.

The exhibition will include sections dealing with chemistry, metallurgy, physics, agriculture and foods, mechanical and electrical engineering, education, paper, illustration and typography, medicine and surgery, fuels, aircraft, and textiles. Firms desirous of exhibiting are invited to communicate with the Organising Secretary, Mr. F. S. Spiers, 82, Victoria Street, London, S.W.1.

Correspondence.

**** Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

**** We do not undertake responsibility for the opinions expressed by our correspondents.*

THE ASSISTANT QUESTION.

To the Editors.

Gentlemen,—As a recently discharged service man who has just resumed taking in your valuable journal, I have been struck by the fact that though nearly all other trades and professions have their trade unions, there still seems to be no one bold enough to improve the status of photographic assistants. Glancing down the Situations Vacant and Wanted we still find the "fully qualified," "operator-retoucher," "capable manager," etc., pleading for £3 or £4 per week; whilst generous firms offer a similar princely salary for expert assistants. Surely a highly skilled technical calling like photography should be paid on a higher scale than this?

In view of this low standard of wages for highly skilled work, it seems to me quite impossible and unreasonable to expect a scheme of education in photography to be seriously considered if the reward for diligence is £4 per week. Are we to admit that prices for work are so cut that employers are unable to raise this standard of pay? If so, cannot prices for work be controlled by the P.P.A.? By all means encourage education for assistants, but elevate the dignity of the profession by creating positions worthy of being filled and studying for. A standard wage is undoubtedly needed, and the profession should be taken in hand and modelled on the organisation of the chemists and druggists, as suggested in your paper. Let the P.P.A. make a determined effort to make photography premier among the higher professions instead of the reverse.—Yours,

E. F.

DEVELOPER POISONING.

To the Editors.

Gentlemen,—In reference to Mr. A. England's letter in the "B. J" on developer poisoning and the use of a pair of forceps for developing bromide prints, I think this is a good thing to use without putting the hands into the developer; but, of course, this would not answer in the case of developing postcards, where a quantity are developed together. I have been a great sufferer from metol-poisoning on the hands and arms, and for the last two years I have worn thick rubber gloves, not the photographic kind, but those gloves which I obtained from an ironmonger's shop and which I believe are used by motor mechanics to protect the hands. Anyhow, the gloves are a good thickness, and they do not puncture like the thin ones. The cost of the gloves is 10s. 6d. I can work just as well with them as without, and I should advise any photographer suffering from poisoning to use them. Of course, they are a little trouble at first, but you soon get used to them. Also I should advise the use of Ujah ointment, which I have found a good thing for metol poisoning.—Yours faithfully,

G. Harper.

The Studio, 15, Market Place, Abingdon.

"CINEMATOGRAPH" OR "KINEMATOGRAPH"?

To the Editors.

Gentlemen,—In your issue of February 21 "Kino" states that the name "kinema" was first used for an English patent in the 'sixties or 'seventies. I have failed to find any trace of this, neither does Henry V. Hopwood in "Living Pictures," the most complete and painstaking historical survey of cinematography in existence, betray any knowledge of the alleged fact.

However, even "kinema"—a purely Greek word—is not "kinematograph," and I challenge "Kino" to produce a single example of the British employment of the latter, spelt with a "k," before 1891-5, during which period the word "cinematograph" was introduced by M. Bouly and M. Lumière.

The particular spelling adopted by the Patent Office is entirely irrelevant. This admirable Government Department is not, and does not profess to be, an authority on orthography, like the French Academy, but merely records and indexes what is placed before it. I have, by the way, looked over a list of a few authoritative text-books of recent years, and find that, out of a dozen taken at random, ten spell cinematograph with a "c." The press and journalism generally is also overwhelmingly in favour of that course.

"Kino" seems quite to have missed the real point at issue. This is, that it is customary, with few exceptions, in English, French, and Latin words derived from Greek ones beginning with or containing "k" to convert it into a "c," whereas the German usage is to retain the "k." The question faces us, Why should we deviate from our general practice and prefer the German way to the French in the case of a word first used in France?

But out of his own mouth "Kino" is unconsciously convicted, for he spells bioscope with a "c." Now, bioscope comes from the Greek, *bios*, life, and *skopeo*, I look. Hence "Kino" ought to have written "bioskope." Why this ridiculous and un-English inconsistency?

The Germans do write bioskop, teleskop, mikroskop, stereoskop, etc. They also write kinematograph, kamera, kameral, kampfer, (camphor), kappe (cap), karikator, kasein, katechu, katopter, katze (cat), klampe, kollimator, kollodium, kopie (print), kork, krystall, artikel, objektiv, and so on. Thus it is evident that, not only in words derived from the Greek but in many others, the Germans instinctively use the "k" where an Englishman or Frenchman would employ "c." Surely, in view of so many instances, let alone the undoubted French origin of the word, all British precedent leans to "cinematograph" rather than "kinematograph."

It is only a minority who now favour the latter, though that minority admittedly includes some who have done yeoman service in motion-picture work. Let them bow to the spirit of the times, and prove their patriotism by dropping that Teutonic "k."—Yours faithfully,

A. Lockett.

11, Cheriton Square, Balham, S.W.17, March 1, 1919.

Answers to Correspondents.

SPECIAL NOTICE.

In consequence of general reduced supplies of paper, as the result of prohibition of the importation of much wood pulp and grass, a smaller space will be available until further notice for replies to correspondents.

Moreover, we will answer by post if stamped and addressed envelope is enclosed for reply: 5-cent. International Coupon, from readers abroad.

The full questions and answers will be printed only in the case of inquiries of general interest.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

T. S.—The Almanac was published on February 6, and as the whole of the edition has been delivered to the trade our publishers are no longer able to supply copies.

SILAS WEIR.—We deal with your question in another column under "Ex Cathedra."

M. E. F.—No better book, as we have said a good many times, than "The Science and Practice of Photography," by Chapman Jones.

J. RITCHIE.—We have never seen advertisements for waste trimmings from prints apart from those of the firms regularly offering to purchase silver residues.

T. R.—There might be profit in it, but it would take a very considerable time to get a connection together. We should regard the proposal with a good deal of distrust.

E. F.—The best means to take is to soak the silk in a solution of sodium bisulphite or, if this is not obtainable, ordinary soda sulphite with some oxalic acid added to it.

F. L. C.—It is rather unusual to experience the difficulty in buying from a wholesale house, but surely from your local chemist to whom you are known you could obtain sufficient for your purposes.

G. N.—It would not work as you suggest. If you add acid to a solution of hypo sulphur is thrown down in a very short time. Sulphite prevents the action, and that is why it is used in making acid fixing baths.

S. F. SLAUGHTER.—Albumenised paper has not been an article of commerce for a good many years. The only way in which you could perhaps get a few sheets is by spending a shilling or so on an advertisement.

S H.—You cannot assume that very much value attaches to the fact of the provisional specification having been granted. Search for possible anticipation of the invention is not made until the specification is filed.

J. S.—In some districts the police require a canvasser for photographic portraits to take out a hawker's licence, but the practice varies a good deal in different parts of the country. You should apply for information to some head police office.

R. A. F.—There is no question which you should choose—viz., electric. In comparison, any gas installation is very greatly inferior in power, and has the drawback of producing heat to an extent which makes it impossible in a studio of small size.

C. R.—Precisely what you suggest was given a commercial trial some years ago, but it was a failure. It is a messy business. The solution stains anything it touches, and it is difficult to know when development is complete, and in any case you have to have some makeshift dark-room in order to put the plates into the solution. No wonder then that altogether the game was not found worth the candle.

B. H.—1. See article on "The Surroundings of the Studio" which appeared in the "B.J." of February 28. 2. Fluted glass is of no use to stop sunlight. Use zinc white stippled on, or starch whitening. 3. For the Boardman reflector use "Blanco," a kind of pipeclay. 4. We think you will find the Cooper Hewitt light quite satisfactory. It is about equal to good daylight.

G. R. S.—You have no legal right to claim the opportunity for making specimen portraits on your own account, although most decent master photographers are ready to give their assistants the facility for so doing. We know that there have been instances where this has been a sore point between master and assistant, and we should be glad to see a more general practice in the direction of encouraging assistant operators to obtain examples of their work.

C. F.—1. If you mean sensitised cards with deckle edge, so far as we know they have not been put on the market here by any of the British firms. 2. We do not know a combined trimmer and beveller of Merrett's, but a line to Messrs. Merrett, Bros., Trowbridge, Wilts., would bring you particulars. 3. The best plan is to tone to a sepia by the ordinary bleach and sulphide process, and then to carry out further toning in the ordinary gold and sulphocyanide bath.

COPYRIGHT.—An appointment was made with a photographer and a photograph taken of the members of a well-known local committee about a fortnight ago and an order received and executed for postcards and enlargements. Last week a reproduction of this group appeared in a well-known paper. Neither the photographer nor any member of the committee have any idea how the paper obtained a copy to reproduce. (1) Is the paper, or the individual who sent the copy, or are both actionable for reproduction without authority? (2) Can the editor of the paper be made to divulge name of sender of photograph?—T. E.

(1) We should say that if the paper has reproduced the photograph without having received a licence from the person who owns the copyright, it is certainly liable for infringement, but it is doubtful whether the action could be maintained against the person who offered the photograph for reproduction. We imagine it would be difficult to show in respect to the latter that he or she caused the photograph to be reproduced. (2) By no means that we are aware of.

The British Journal of Photography.

Line Advertisements.

Charges for Insertion.

Since advertisements cannot be inserted until fully and correctly prepaid, senders of line announcements are asked to bear in mind the scale of charges. They will thus save themselves delay in the publication of their announcements. A Schedule by which an advertisement can be correctly priced will be sent on request.

Net Prepaid Line Advertisements.

12 words or less 1/-
Extra words ... ... 1d. per word.
(No reduction for a series.)

Special Note. Adv'ts under a Box Number.

"Box No." and office address ... ... charged as 6 words.
For forwarding replies add ... 6d. per insertion for each adv't.
If replies are called for this latter charge is not made.

Advertisements cannot be inserted until fully and correctly prepaid.

Orders to repeat an adv't must be accompanied by the advertisement as previously printed.

Advertisements are not accepted over the telephone or by telegram.

The latest time for receiving small line advertisements is 12 o'clock (noon) on Wednesdays for the current week's issue.

Displayed Adv'ts should reach the Publishers Monday morning.

The insertion of an Advertisement in any definite issue cannot be guaranteed.

HENRY GREENWOOD & CO., Ltd., Publishers,
24, Wellington Street, Strand, LONDON, W.C. 2.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3071. Vol. LXVI. FRIDAY, MARCH 14, 1919. Price Twopence.

Contents.

	Page
Ex Cathedra	121
Fog in the Studio	122
The Efficiency of the Focal-Plane Shutter	123
Practicus in the Studio. By Practicus	125
A New Photographic Transfer Process	127
Purple Tones on Bromide Paper by Redevelopment in Daylight. By Ernest Manley	128
Death of Mr. Welborne Piper	129
Advanced Export Trade	130
Fortnightly Exhibitions	130
Assistants' Notes	131
Patent News	131
Aalbecta	132
Meetings of Societies	133
Commercial and Legal Intelligence	134
News and Notes	134
Correspondence—Cinematograph or Kinematograph—Photography of the Royal Engineers—The Assistant Question	134-6
Answers to Correspondents	136

SUMMARY.

We regret to announce the death on Tuesday in last week of Mr. C. Welborne Piper, a member of the staff of the "British Journal," and widely known for his writings and experimental work in photographic chemistry and optics. (P. 129.)

In a contributed article, Mr. Ernest Manley gives working details for the production of purple bromide prints by bleaching and redevelopment in daylight. (P. 128.)

The article this week by "Practicus" deals generally with the arrangements for the postcard studio, such as the utilisation of small working space, the making of a number of negatives on one plate, and the production of the prints by enlarging. (P. 125.)

The optical conditions, which in practice may reduce the efficiency of the focal-plane shutter to as low a figure as 60 per cent., are the subject of an article on page 123, in which the effect of the distance between the shutter-blind and the sensitive surface, particularly in the use of a large-aperture lens, is shown.

The development transfer paper known as Kerotype, invented by Messrs. Middleton and Kent, may be used for the production of prints upon supports of all kinds. In reprinting an account of the recent demonstration before the Royal Photographic Society, we are enabled to add a list of British patent specifications relating to stripping film. (P. 127.)

At the Royal Photographic Society, on Monday evening last, Mr. W. B. Appleton, of Messrs. Taylor, Taylor, and Hobson, gave a lecture on and demonstration of the improvements made by his firm in the manufacture of lenses for aerial photography. Mr. Hamelkuss, of Messrs. Ross, Limited, added some notes on the work of his firm. (P. 133.)

Details of a camera for aeroplane photography driven by power and making exposures automatically are given in Patent News. (P. 131.)

Portable studios, rapid fixing baths, half-watt lamps, sensitising silk, the Shops Act, and other matters are the subject of brief replies to correspondents. (P. 135.)

The presence of fog in the studio is a cause of negatives, deficient in brilliancy, which may be mitigated in part by screening the source of light, whether day or artificial, and in part by the use of a lens of shorter focus. (P. 122.)

Yellowing of a lens with age or by insufficient care is a thing not to be disregarded in purchasing an instrument secondhand. (P. 121.)

The camera of vest-pocket size may have its use in the studio in the way of making a portrait unknown to the sitter. (P. 122.)

EX-CATHEDRA.

Complete Development. The maxim which is rightly emphasised to makers of bromide prints, namely, to develop thoroughly, is one which even now, although it has been repeated over and over again, is largely disregarded. Neglect of it is one of the chief causes of unsatisfactory quality in sepia-toned prints, the results of toning an image which has been rapidly and, therefore, superficially developed being greatly inferior to those in which development has been carried more deeply into the film. One rule which has been given for the guidance of bromide printers is that the time of development should be at least three minutes, and exposure adjusted accordingly in order that the print at the end of this period of development should not exhibit the effects of over-exposure. But papers and developers having their particular idiosyncrasies, perhaps a more usefully applied rule for discovering whether prints are receiving this "full" development is to immerse half of a print only in the developer, and after the expiration of, say, half a minute to allow the developer to act upon the whole. If, then, development can be continued so as to yield a satisfactory print which does not show a difference between the two halves, the worker may be satisfied that his development is of the required fulness. On the other hand, a difference between the two halves will indicate that exposure can be advantageously cut down.

• • •

Colour of Second-hand Lenses. Those who are buying secondhand lenses will do well to give the question of colour some consideration. As is well known, long exposure to damp or atmospheric conditions tend to discolour the glass of the lens, or cause the balsam cementing the components to deteriorate with the same result. Some secondhand lenses that we have seen suffer from this very badly, the glass having quite a yellow tinge, in others, though existent, the defect is not so apparent, but if present the marked aperture of the instrument does not represent its actual working speed. We had one such lens that when examined in a casual way showed little or nothing the matter, but when placed against a sheet of pure white writing paper a slight discolouration was at once noticed. Slight though this was, it had a marked slowing action when using ordinary plates, though when orthochromatic emulsions were employed this to a large extent disappeared. Those having such instruments will do well to send them to one of the firms advertising in the advertisement columns of this Journal for repolishing or recementing of the glasses as the case may be, while if buying a secondhand instrument prospective buyers should be on the watch for a defect, which, though it might easily pass unnoticed, reduces the actual value of a lens very considerably. This discolouration is

perhaps more frequently met with in the older instruments than in the modern anastigmats, unless these have been very much exposed to bad conditions, but it is a condition of things that all owners of good cemented anastigmats will do well to guard against.

* * *

Camouflaging the Camera. We commented recently upon the use of the small camera in certain branches of photographic work where its advantages may be turned to good account. A further instance of its value as a supplementary instrument in the studio was told to us the other day by a professional friend. He was commissioned to make a portrait of a child of whom previous experience had taught him that, however pleasing might be the expression on the little sitter's face, it instinctively froze directly the operator made a move towards the camera. The studio instrument was prepared in the usual way, and in front of it was placed a table with piles of books, etc., very carefully arranged to conceal a previously focussed vest-pocket camera, with its shutter set ready for an exposure. The usual attempts were made with the studio instrument and with small hope of obtaining a satisfactory picture. The operator turned away rather disgusted. Almost at once the little sitter was herself again, and casually, as it were, turning to the table the operator pressed down the shutter release of the vest-pocket camera, covering the action as if by taking up a book. As was expected, the exposures made with the studio camera were failures from the point of view of expression, but the small camera yielded a lifelike and pleasing portrait. The negative was carefully enlarged, and the result was an order for some dozens of prints. The idea of camouflaging a small camera should prove of value to those photographers who have to take portraits of nervy sitters, since the exposure may be made at a selected opportunity without the sitter being aware of it. Such a plan should help in overcoming many a difficulty in this respect. Though the negative is small, the quality can be of the best, and the resulting enlargements with a little working-up should give no indication whatever that they are not contact prints from large-sized original negatives.

* * *

Varnishing Negatives. Few photographers at the present time varnish their negatives, nor when ordinary bromide printing or enlarging is to be the medium is this course really necessary. But when a number of P.O.P. carbon or platinum prints are required from one negative, and the printing is done in the semi-open air for the most part, in damp weather it is a wise precaution to give the negatives a coat of ordinary cold varnish. Many present-day operators, however, find a great difficulty in getting an even coat of varnish over the entire plate by the ordinary method, and if this is not done there is a tendency for the varnish to dry in ridges, which means, of course, corresponding markings on the prints. Varnishing negatives by flowing the varnish on and tilting the plate at various angles until the whole is covered, and then draining the surplus back into the bottle, is an operation that requires a certain amount of skill, which can only be obtained with practice. We have for some time past varnished our negatives with an ordinary camel-hair (or hog-hair) brush. The exact kind is not very important, provided that it is well made and free from loose hairs. For this method, though not strictly orthodox, we may claim that it is comparatively easy to put a light but even coat of varnish on the film. None of the varnish need be got upon the back of the plate, and negatives may be very rapidly treated. Care should be taken not to get the brush too full of the varnish, or uneven coating may result. To those who have had no experience of varnishing negatives this alternative method may be recommended, although the essential feature of it is that a thin coating is rapidly applied.

FOG IN THE STUDIO.

In many localities, notably in the London district, the state of the atmosphere has left much to be desired from the photographer's point of view. Not only has there been an actual deficiency of light through the presence of more or less yellow fogs, but there has been great difficulty in securing brilliant negatives on days when the light was fairly good, because of the general haziness of the atmosphere. Many photographers suffer from this fogginess without quite being aware of the actual cause of it. A simple experiment which will show in a rough way how much fog is present in any room at various distances can be made with the aid of two ordinary black velvet focussing cloths, velvet being chosen because it has less reflecting power than any other material in ordinary use. One piece of velvet is crumpled up so that some parts produce deep shadow and put on a table in the position usually occupied by the sitter. The operator then stands by the camera at the distance at which a full-length portrait would be taken, and holds up the other about a foot from his eyes so that it half covers the piece on the table. If there is any appreciable amount of haze present he will find that the deep shadows on the distant piece appear quite grey in comparison with those on the piece which he is holding, and at once finds an explanation of the flat negatives which he has been obtaining.

Having established the existence of the fog, our aim is now to minimise its effects, and there are many methods by which this end may be partially attained which, when put together, result in a substantial improvement in the quality of the negatives. In the first place, the studio windows should be kept clean, so that as small an area of glass as will give the desired lighting will be needed to obtain short exposures. By thus closing out all unnecessary light we reduce the general illumination of the fog and get a much brighter image. This can perhaps better be seen when working with artificial light. If we build the lamps in with screens or backgrounds so that the light falls upon the sitter only and none reaches any other part of the studio, there are only three or four feet of fog to work through, while if the whole of the studio is illuminated the amount is greatly increased.

In foggy weather the lighting of the sitter may be more concentrated than is usually necessary, as a more vigorous negative will then be obtained, and printing can be carried on until the shadows are of sufficient depth. Windows become coated with smoke in a day or two in the winter and act as undesirable diffusers, so that it is advisable to clean at least the panes which it is intended to leave unscreened.

A fairly warm temperature and good ventilation tend to reduce fog and to clear it away quickly. We have often noticed that a room or studio has remained foggy long after it has become fairly clear outside. When the necessary power is available, an electric fan will do much to establish a current of air, which should be directed towards an open window or door. A proper exhaust fan fitted near the roof is the best form, but the portable ones are of considerable value.

We have already pointed out how the effect of fog may be reduced by cutting out all unnecessary illumination. A further improvement may be made by using a lens of

as short a focal length as possible, though not so short as to introduce distortion. Where sufficient length of studio is available, it is now common to use sixteen or eighteen-inch lenses for all-round cabinet work, and it is quite good practice in clear weather. But at other times a ten or twelve-inch lens will be found to give much brighter pictures. As a matter of fact, many photographers have found this out without knowing the reason, and attributed the improvement in brilliancy to some other property in the lens than its focal length. Whatever lens is being used, it should be kept clean. Lenses will get as dirty as windows do in a smoky atmosphere, and will then yield flat images in the clearest light. If a lens has not been kept clean it is interesting to take a negative with it before cleaning and one directly afterwards. In most cases the contrast will be striking. Lenses should be cleaned carefully, a vigorous rub with the corner of the focussing cloth is not to be recommended, as such treatment soon "greys" the surface. An old worn handkerchief, kept in a box free from dust and grit, should be used. If there is a greasy deposit from town smoke, a single drop of pure alcohol may be applied on a tuft of cotton wool, and then the surface quickly polished with the handkerchief.

Although we are opposed to all "tinkering" methods of development, the judicious use of bromide upon exposures which have been made under adverse conditions is quite permissible. To describe the action of bromide in popular language, we may say that, when used upon an over-exposed or foggily lighted plate, it allows the highlights to get a start before the shadows begin to develop. If the plate be developed right out this advantage is lost, but as most portrait negatives do not reach this stage there is a decided benefit to be obtained by the use of bromide in the cases we have mentioned. It is necessary to add the bromide to the developer before immersing the plate. Once development has started it is of little, if any, effect. The character of the plates used should also be taken into consideration. Some brands tend to give brighter results than others. These should be chosen for foggy weather, as, although the scale of tones may not be so long, the resulting print is more satisfactory.

THE EFFICIENCY OF THE FOCAL-PLANE SHUTTER.

It is perhaps uncommon nowadays to meet with the claim on behalf of the focal-plane shutter that its efficiency, from the very nature of the instrument, is 100 per cent., that is to say, that the shutter admits the full cone of rays from the lens on to the plate during the whole period of exposure. In the early days of the focal-plane shutter, before the optical principles of its action were realised, and while it was accepted as the last word in shutter construction, one found enthusiastic supporters of it, ready to assert that it gave six times the action of light upon the plate in comparison with a shutter of the diaphragm type. Assuming even that the focal-plane shutter possessed an efficiency of 100 per cent., such a statement was hard upon the diaphragm type of shutter, which must be an exceptionally bad one to have an efficiency as low as 16 per cent. However, a recognition of its action, together with experience in its practical use, has shown that the focal-plane shutter, far from being the ideal instrument which it was originally conceived to be, possesses limitations and disabilities apart from its fragility and liability to get out of order which should discourage anyone from over-rating it. Nevertheless, there is probably among some photographers a certain distrust of the criticisms which have been made of the focal-plane shutter in the way of showing the reason for its lesser efficiency in certain circumstances. The idea that a slit travelling immediately in front of the plate should, as a matter of course, transmit to the latter all the light which comes from the lens is one that at first sight appears so readily acceptable that no doubt many people have been inclined to pooh-pooh the figures which have been given, and which may run to as low as 50 per cent. for the efficiency of the shutter. Hence it may be worth while to disinter from the writings of that very lucid and competent French authority on photographic optics, Colonel Moessard, part of the study of the focal-plane shutter published at one of the International Congresses of Photography as long ago as 1901.

Here is Colonel Moessard's diagram, in which O P represents the lens diaphragm of diameter o. Q R is the sensitive surface and A B the blind of the focal-plane shutter having a slit of width *a*. The distance, *e*, of the blind from the sensitive surface is shown on an exaggerated scale, for the sake of clearness, but, as will be seen later on, very considerable separation of the two is commonly met with in focal-plane cameras. The distance, *f*, is the focal length of the lens, the latter for the purposes of the present study being assumed to be working at infinity. Well, supposing the slit, travelling in the direction of the arrow, to have reached a point shown in the diagram, let us draw lines from the margins of the lens diaphragm O P to the edges of the slit and continue them till they meet the sensitive surface at the points E, F, G, and H. Then it will be clear from a glance at the diagram that the only portion of the sensitive surface which receives all the rays coming from the lens is that which lies between F and G. The portion E F receives rays from the lower part of the lens and the portion G H from the upper, the slit giving rise to a kind of vignetting action. Now the question which arises, which is of great practical interest and which is very clearly worked out by Colonel Moessard, is the production (from this diagrammatic representation) of a formula by which the efficiency of a shutter can be calculated when the necessary constants, namely, the relative aperture of the lens, width of slit, and the distance of the blind and plate are known. The reader must bear with a very little geometry in following the working out of this formula.

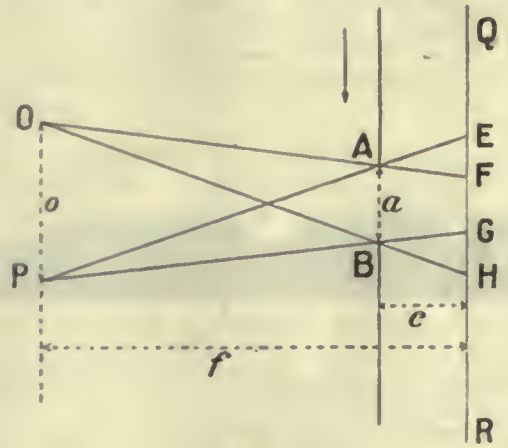


Fig. 1.

As the basis of it we take the common definition of shutter-efficiency, namely, the ratio of the time during which the whole aperture of the lens transmits rays to the plate—the ratio of this time to that during which the lens is uncovered to the plate at all. Now it will be seen from the diagram that for each band of plate which is exposed the action consists of three parts. As the shutter slit comes into position the portion G H is first gradually uncovered, the portion F G receives all the rays from the lens and the portion E F obtains those coming from the lower margins, these being first cut off as the blind continues its course. Thus it will be seen that the covering and uncovering of the portions E F and G H while equal in time are opposite in order. Therefore, one may reckon one only of the two equal times occupied in uncovering the portion G H and covering the portion E F as representing one of them during which all rays from the lens reach the sensitive surface. Now, inasmuch as the blind runs, or is supposed to run, at a constant speed, we can take as a measure of the time which elapses in these successive phases of its action the distances E F, F G, and G H. On the basis just mentioned the period of full action of the lens will be represented by E G and that for the period during which any light at all reaches the particular band of the plate by the distance E H. Thus the efficiency of the shutter will be the ratio E G : E H, and the next thing we have to do is to find a form of this ratio which shall consist of the quantities, viz., the width of

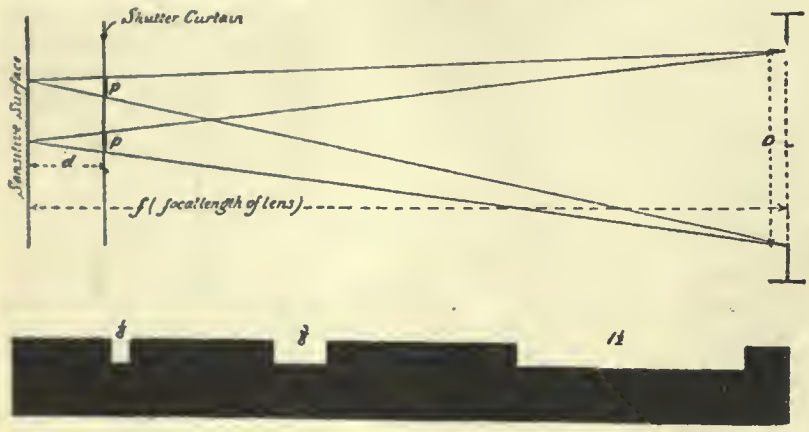


Fig. 2.

the slit, the distance between blind and plate, and the F number of the lens.

It is clear from the geometrical construction that

$$E\,F : O\,P\ (= o) :: e : f - e. \quad \text{That is to say } E\,F = \frac{e\,o}{f - e}$$

In the same way, under the geometrical construction,

$$E\,G : a : f : f - e. \quad \text{That is to say } E\,G = \frac{f\,a}{f - e}$$

Now E H is equal to E G + E F, G H being equal to E F. Therefore, adding the two values just found for E F and E G we obtain for E H

$$\frac{f\,a + e\,o}{f - e}$$

$$\text{Therefore the ratio } E\,G : E\,H = \frac{f\,a}{f\,a + o\,e}$$

Now, this formula can be reduced to the form we are searching for by dividing numerator and denominator by o. It will be seen that f divided by o is simply the F number of the lens.

$$\text{Thus, after this operation, the formula becomes } \frac{F/No. \times a}{F/No. \times a + e}$$

In other words, in order to find the efficiency of the shutter we multiply the slit-width by the F/No. of the lens; we also repeat this operation and add the distance from blind to plate. The result of dividing the former quantity by the latter gives the efficiency as compared with 1. To express in percentages, it is multiplied by 100.

An example will make this clear. With a slit-width of $\frac{1}{8}$in., f/8 lens, and a distance of $\frac{1}{2}$in. from blind to plate, calculate the shutter efficiency. Here in the formula a the slit-width is $\frac{1}{8}$th whilst e, the curtain distance, is $\frac{1}{2}$in. The calculation, therefore, is:—

$$\frac{\frac{1}{8} \times 8}{\frac{1}{8} \times 8 + \frac{1}{2}} = \frac{1}{1\frac{1}{2}} = \frac{2}{3} = \cdot 66 = 66 \text{ per cent.}$$

For those who would have some visible basis on which to evolve the foregoing formula a study of a piece of exposition contained in an issue of the *Photo Miniature* of the year 1916 may be commended. The diagram which in our contemporary illustrates this same question of efficiency in the focal-plane shutter is differently marked from that of Moessard, D representing the diaphragm aperture, d the distance from blind to plate, and s the slit-width.

It may be pointed out that by simple geometry the width p of the cone of rays is the curtain distance divided by the F/number. This follows from the two triangles on the bases D and p.

$D : p :: f : d$. Whence $p = \frac{D\,d}{f}$. But the focal length (f) divided by the diameter of the stop (D) is the f/number, so that $p = \frac{d}{F/No}$.

Further, it is easy to establish a rule by which to calculate the efficiency of the shutter under any condition. Remember that the efficiency is the imaginary (calculated) time (T_1) during which the cone of rays is fully operative divided by the time (T_2) during which the cone is operative to any extent at all. Assume that the curtain is moving at a certain speed, t, signifying the time, t, required for it to traverse an inch or a foot—it doesn't matter what the unit is for our purpose. To find T_1, slide the notched strip (of Fig. 2), representing a slit-width s, along the line of the curtain, and you will see that its passage over p falls into three sections, viz., one on which the full cone is operative, is $s - p$, and two others (at the beginning and end of its transit) in each of which the cone may be imagined as, first, completely covered and then just covered by a slit of width p. Each of these corresponds with the full action of a slit of $\frac{p}{2}$, so that adding these three sections together, we have $\left(s - p + \frac{p}{2} + \frac{p}{2}\right)\ t$ seconds as the time of the exposure during which the full cone is operative, in other words $s\ t$ seconds. Finding T_2 is simpler. Again, if you run the notched strip over p you will see that it is uncovered (*wholly or partially*) over a length $s + p$. Hence the time, T_2 is $(s + p)\ t$ seconds. And thus the efficiency or the ratio of T_1 to T_2 is $\frac{s}{s + p}$. This is a very simple formula, and, although it may not be perfectly correct, since it assumes the blind to move at a quite uniform speed, it allows of figures for efficiency being usefully calculated.

It will be seen from the Moessard formula that the lower efficiency of the focal-plane shutter arises from the fact that, as used in practice, it does not move in the focal-plane. The nearer it is to the latter the smaller will be the reduction of efficiency, even when a lens of large aperture is used. If the blind works as close as one-eighth of an inch to the plate, as it does in a focal-plane film camera, it will be difficult for the

efficiency to fall below 80 per cent. It is also clear from the formula that if the slit-width is large or if the F/number is large in comparison with the distance from blind to plate, the efficiency will also be maintained at a high figure. It is when a narrow slit is used with a large-aperture lens (a low F/number) that efficiency can fall to as low a figure as 50 per cent. Unfortunately, these are the very conditions which arise in photographing rapidly moving objects when the very briefest exposure requires to be given and when, therefore, the operator has need of the highest efficiency in the shutter. It is, therefore, of the first importance that by some means or other the maker of cameras for this purpose should contrive to bring the sensitive material as close as possible behind the plane in which the shutter blind moves. A few examples calculated from figures all of which may be said to come within the range of practical work will give a good idea of the extent to which efficiency can vary in practice and of the factors which contribute to it.

I.—Efficiencies (in Percentages). F/4.5 Lens.

Blind Distance from Plate.	Width of Slit. ⅛ inch per cent.	¾ inch per cent.	1½ inch per cent.
½ inch	82	86	98
⅜ inch	60	82	95
¼ inch	51	77	93

II.—Efficiencies (in Percentages), F/8 Lens.

Blind Distance from Plate.	Width of Slit. ⅛ inch per cent.	¾ inch per cent.	1½ inch per cent.
½ inch	90	96	99
⅜ inch	73	88	97
¼ inch	67	86	96

The reader can see from these figures that in using a focal-plane shutter fitted with a large-aperture lens it is always better as regards efficiency to obtain a given exposure by a wide rapidly moving slit rather than by a narrow slit at a lower tension.

PRACTICUS IN THE STUDIO.

[Previous articles of this series, in which the aim of the writer is to communicate items of a long experience in studio portraiture, have appeared weekly since the beginning of the present year. It is not thought possible to continue the series to the length of that by the same writer which ran through the "British Journal" some years ago, but if any reader among the younger generation of photographers, and particularly those engaged as assistants, has a particular subject which might be dealt with, his or her suggestion will be welcomed. The subjects of the previous articles of the series have been as follows:—

A Talk About Lighting (Jan. 3).
The Camera and the Lens (Jan. 10).
Managing the Sitter (Jan. 24).
Backgrounds (Jan. 24).
Studio Exposures (Jan. 31).
Artificial Lighting (Feb. 7).
Printing Processes for Portraiture (Feb. 14).
Studio Accessories and Furniture (Feb. 21).
The Surroundings of the Studio (Feb. 28).
Studio Heating and Ventilation (March 7).

THE POSTCARD STUDIO.

At the present time there are many demobilised men who are desirous of taking up photography as a livelihood, either in the small towns or villages of our own country or, more especially, in the overseas Colonies and Dominions. As a large proportion of these intend to make a start by making postcards their principal line, a few directions as to the way in which this may be readily and economically done may be of service to them.

The question of premises naturally comes first, and as I have no knowledge of overseas conditions in this respect I must confine my remarks on this head to Great Britain alone. A shop front seems to be almost essential to success in this class of business, as nearly all the orders will be "chance" ones, that is to say, they will be obtained through the specimens and announcements displayed in the window. If carefully arranged, quite small premises may be made to answer; in fact, I know of one place, a half-shop, the total width of which was eight feet, in which a very nice little business was carried on. The place was planned thus: eight feet or less from the window a partition was erected, leaving a tiny shop in which inquiries could be answered and sitters could wait, a small table and some long seats being provided.

A narrow doorway gave access to the studio, which was about 18 feet deep. On the remaining portion of the partition the backgrounds were fixed, a plain one being nailed to the wood while a scenic one was fixed on a roller so that it could be lowered when wanted. A part of one side-wall was whitened to serve as a reflector, while a Jandus enclosed arc was suspended on the side nearest the doorway. A couple of chairs and a "rock" accessory formed the furniture. A shelf at the further end carrying a few toilet accessories and surmounted by a small mirror served as a dressing-room, and behind this was the dark room which had originally been the shop parlour. Not only did this tiny place turn out postcards, but quite a considerable number of cabinets of very fair quality. This arrangement may be taken as typical of the shop studio, and it may, of course, be elaborated when greater space is available.

As all the lighting arrangements are fixed, and the sitter can only occupy one position, a great variety of effects cannot be obtained, but postcard patrons are not exacting in this respect, and if one style can be decently achieved it is all that is absolutely necessary. I must not forget to mention that my favourite head-screen is as useful here as it is in more pretentious studios.

The camera and lens should be selected with a view to the special work to be done, and as most cheap postcards are made by enlarging from small negatives, a camera designed for the purpose should be procured. Several firms supply these, and the beginner should not be persuaded to start with an ordinary camera, as the extra cost of full-sized plates will soon eat up any saving which may be effected. It is usual to take four negatives upon the half of a half-plate cut lengthways, viz., 6½ x 2¾, this size being regularly supplied by most plate makers. The repeating back should be removable, so that full-sized postcard plates or half-plates can be used for groups or a better class of work for which the negatives have to be retouched and printed by contact. For the small negatives a rapid portrait lens may be used, those originally made for stereoscopic work by Ross and Dallmeyer being very suitable. The focal length is about five inches and the aperture f/4. These may often be obtained second-hand for about a couple of pounds. A rapid anastigmat, say, f/4.5, of similar focal length may be used, but should

be tested beforehand as the definition, although more even over a larger plate, is not always as critically sharp as that which a portrait lens gives over a small field. For full-sized postcards and half-plates, a portrait or anastigmat lens of from 8 to 10 inches focal length, according to the length of studio, will be most useful. A behind-lens shutter of the flap or Packard Ideal type, should be fitted so that it may be used with either lens without readjustment. This may easily be done by fixing a shallow box inside the camera front to allow the lens to project without touching the shutter.

I now come to the dark-room arrangements, of which it is obviously impossible to give any definite plan without knowing the size and shape of the available space. One thing is certain: that the larger the dark-room can be, within reasonable limits, the better it will be for the health of the worker and the quality of the work. No matter how small it may be, as much sink accommodation as can be managed should be arranged for. It saves much time not to have to move one dish or tray out of the way before another can be used. If possible, negative making and printing should be done in separate sinks, for not only can two people work at once, but the work will be cleaner and more uniform. The illumination should be as bright as is consistent with safety, and it will be found good policy to invest in proper safe-lights for the lamps instead of trusting to fabric or doubtful ruby glass. With a medium which only allows red light to pass a much more powerful illuminant may be used and greater comfort in working obtained at the cost of an extra shilling or two. The source of light may be electricity, gas, or oil. If the former be used the ordinary carbon or metallic filament lamps are best, as the light is more yellow to begin with than that of the small half-watts which are now rapidly coming into general use. Incandescent gas is better than the ordinary flat flame, as it is more economical, gives less heat, and is not likely to smoke the red glass fronts of the lamps. If oil be used, the flame should be of fair size and the lantern arranged so as to supply plenty of air for combustion, otherwise the light will be dull and there will be much smoke. Dish development and fixing will usually be found most convenient, as the exposures will have to be developed in small batches. It will be found advisable to use the same kind of developer for negatives and prints, as this simplifies matters, and I would recommend metol-hydroquinone to be chosen, as it gives stainless negatives and has better keeping qualities than amidol. Those whose hands will not stand metol may use Azol with equally good results. Do not allow developer to stand in an open dish when not in use. It should be poured into a glass pickle-jar and stoppered; it will then keep in condition much longer. An acid fixing-bath should be used, as it keeps cleaner and also has a tendency to harden the negative film, the advantage of which I shall presently mention. In while-you-wait studios the washing of the negatives after fixing is necessarily very short, but it should be done as thoroughly as the time allowed will permit. And there is no better way than by allowing a stream of water to flow over the surface. There is a very old device which effects this perfectly. A small wooden board about 18 inches long and a little more than the length of the plates in breadth has a narrow strip nailed down each side to confine the water. At intervals of a little more than the width of the plates pairs of small brass nails are driven in for the plates to rest against. A loop of string is fastened to one end of the board, and this is slipped over the tap so that the board slopes down into the sink, the stream, from the tap will then run evenly over all the plates. If only a minute's washing be given in this way the negatives will be safe to print from and will not crystallise in the enlarger.

Printing is usually done by means of a small vertical enlarger, which is frequently home-made. It may be described thus:—A long box is fitted to take in its upper part an incandescent electric or gas light, with a piece of ground glass an inch or two below it. Underneath it is a shelf or stage with a central opening, just the size of one of our little negatives; below this, again, is another shelf, in which a rapid lens is fitted so as to come exactly central with the opening in the negative stage, the image being focussed upon a board fitted with guides and mask, fixed upon the bench or any convenient support. The focus is adjusted so that the image fits the postcard, and fixed once for all. A yellow glass flap or slide must be fitted behind the lens to serve as an exposing shutter, and this should be actuated by a cord and treadle, so that it can be worked by the foot and both hands left free to manipulate the strip of six cards, which is slipped under the mask until all the exposures are made. The next negative on the strip is then slipped into position over the opening and the process repeated. A vignetting card may be placed where most convenient, when required. A condenser is not needed for such small negatives, as the area of ground glass evenly illuminated by the lamps mentioned covers them very well.

For contact prints a strip printer should be installed, and care should be taken that the opening allows of a print being made from the full half-plate when required. It should also be capable of holding a vignette card if needed.

Again I wish to emphasise the desirability of using specially made appliances for this special work. The developing dishes should be made of a suitable size to fit the strips, which should not be developed by dragging through a small dish, nor should the developer be wasted by using an unnecessarily large one.

In postcard businesses quite a nice amount may be made by taking orders for enlargements, and a good show of these should be made in the window. If the studio is a "one-man" concern it will probably pay better to get these made and finished completely by a trade firm. If the photographer decides to do his own he must invest in a half-plate enlarger, and if he is lucky enough to have a good basement under his shop it will make an excellent enlarging-room. No opportunity of bringing this branch of trade under the notice of customers should be neglected, and a special price made when an enlargement is ordered at the time of sitting.

From the small strip negatives miniatures for brooches and lockets may be printed by contact and coloured. It is a good plan to make a special exhibit of six postcards, an enlargement, and a coloured miniature all from the same negative, with the price, together and separately.

The postcard artist will not, perhaps, have much time for outdoor work, but in small places he will frequently be called upon to take wedding and other groups, shop fronts, and the like. For this purpose a whole-plate camera should be chosen, as smaller plates can be used when desired. An eleven-inch rectilinear or anastigmat and a six-inch wide-angle lens will be a good selection. This camera will also be useful for copying or other odd work which may turn up.

In conclusion, I would caution the beginner against purchasing cheap lines in cards and other material. The experienced hand may take risks in this way, but the novice should not handicap himself by using materials in which he has not the fullest confidence.

PRACTICUS.

MESSRS. MARION AND FOULGER, LTD., write to the effect that they are afraid the mention of their exhibit at the British Industries Fair in our issue of February 28 may have been read to mean that they were merely exhibitors of another firm's goods. We are glad to correct that impression by making it clear that all Messrs. Marion and Foulger's goods are made in their own works, and for that reason were eligible for exhibition at the British Industries Fair, to which only manufacturers are admitted.

A NEW PHOTOGRAPHIC TRANSFER PROCESS.

The following account of the demonstration at the Royal Photographic Society by Messrs. Middleton and Kent, of the Kerotype Company, of the newly-introduced stripping bromide paper which now appears in the Society's journal, supplements in some respects that which we gave at the time.—Eds. "B.J."

Mr. Middleton, before proceeding to the demonstration, said that some years ago, while conducting experiments in three-colour photography, Mr. Kent and he found, as others had done, that the great problem was the combining of the three constituent images in correct register. They had also desired to obtain the constituent images by dye-toning a silver one, and to avoid the necessity of printing in daylight. This necessitated the use of a transferred image, and as the carbon process could only be printed by daylight and was otherwise unsuitable, while the other transfer papers, though permitting of the use of artificial light, were somewhat troublesome, uncertain, and limited in their application, they were obliged to devise a new one.

The bulk of the processes involving the use of transfer and stripping films were devised to avoid the use of glass for negative purposes. The parent of them all for preparing the positive was the collodion process of transfer, which was introduced about 1857. In this the image was prepared by the wet-plate process on a waxed plate, transfer being subsequently effected on to gelatine paper. The converse of this—i.e., coating the collodion on to waxed paper and subsequently transferring on to gelatined glass for negative purposes—was suggested by Laboureux in 1878, and in succeeding years many suggestions for a stripping paper were made. In some cases the paper was waxed, in other coated with rubber and other resinous and resinoid materials. Sometimes solvents (aqueous and others) were necessary for release, in other cases the film became detached in the developer or automatically on drying. The underlying idea was to obtain at the finish a gelatine image detached, so as to form in itself the printing negative. Only one of these processes, the Eastman and Walker "Transferotype," survived to this day.

The ideal transfer process, to which none of these others approximated, should be one in which (1) the support was textureless and translucent, so that printing-through should be possible without much loss of detail or prolonged exposure; (2) the support was little affected by damp, so that register might be possible of one image on another and yet sufficiently porous to permit of the use of aqueous adhesives to transfer on to non-porous surfaces; (3) the support was without tendency to tear, and sufficiently plastic to admit of transfer on to domed or curved surfaces; (4) the emulsion parted with facility when transferred, and was yet so adherent that there was no danger of frilling or blistering in development or of self-stripping when stored; (5) the prints when made would be capable of being kept before transference for as long a period as might be necessary; and (6) double transfer on to any surface was simple and easy, so as to avoid lateral reversal, which could not be escaped unless "printing-through" was adopted.

A long series of experiments had convinced them that paper impregnated with paraffin wax most nearly fulfilled the first three of these conditions, and they subsequently devised a substratum consisting of a powdery nitrocellulose deposited from an aqueous ethereal alcoholic solution, and this enabled any sensitive gelatinous material to be coated thereon, thereby satisfying the three latter conditions. The full details were disclosed in their patent No. 12,091 of 1915. The paper was prepared continuously, i.e., it was put in as a reel of ordinary plain photographic paper, passed through a trough full of hot wax, and after buffing or calendaring in order to lay the hairs down again while the wax was still warm, was coated with the substratum. This passed through a heated chamber, where the air was exhausted, and was finally coated with ordinary photographic emulsion in a coating machine.

Mr. Middleton here showed examples of the paper at various stages—plain, waxed, coated with substratum, and coated with emulsion. He said that this paper would be found to have many applications, many novel effects being possible by its use, and the process of so transferring photographs would appeal to everyone owing to its simplicity, ease and certainty in application, the large variety of surfaces, both as to texture and form, upon which the transfer could successfully be made, and the pleasing nature of the results. In addition, many novel colour toning effects were obtainable, owing to the nature of the support and the fact that this formed no part of the final print.

The paper was treated exactly as ordinary bromide paper, but in order to avoid lateral reversal on transfer it was necessary to place the paper in the frame with its waxed support next the negative, so that the printing took place through the support. The translucency and absence of texture in the support was such that the loss of quality was not unpleasing, but should this slight loss be objected to, and non-reversed transfers without such "printing-through" be required, it was necessary either to print in an enlarging lantern, placing the negative with the image towards the light, or, in the case of film negatives, to reverse the negative in the frame so that the celluloid was next to the sensitive side of the paper, or to resort to double transfer, which he would presently describe.

Kerotype paper, as it was called, was made in three degrees of speed: Slow bromide for contact prints, rapid bromide for enlargements, and gaslight. The printing, exposing, and developing of the paper differed in no way from that of ordinary bromide or gaslight, and as to washing, owing to the impervious and temporary nature of the support, seven minutes in running-water would be found ample to ensure permanency. Care should be taken to see that the prints did not lie closely on one another, if the washing was so restricted. Mr. Middleton here passed round some Kerotype prints and enlargements, and also some strippers with which he demonstrated the pulling off of one or two enlargements.

He then proceeded to show how such prints were transferred on to diverse surfaces. For the large majority of such surfaces all that was necessary for single transfer was a 5 per cent. solution of soft gelatine. For all surfaces which were not cockled or spoiled by damp, he simply wetted the Kerotype print thoroughly, placed a pool of the lukewarm gelatine solution—say, 90° or 95° Fahr.—in the centre of the surface to which transfer was to be effected, laid print in contact, lightly squeegeed, and left under pressure between blotting paper for a few minutes and placed to dry. In this fashion he made transfers successively on carbon transfer paper, on wood, on metal and on porcelain, which last, having a domed surface, required a little extra patience in manipulation. In cases where the surfaces would be spoiled by damp, such, for example, as thin plain paper, vellum, satin, and so forth, the procedure was slightly different. In this case it was advisable to make up the gelatine solution with a considerable proportion of alcohol therein and to add a modicum of golden syrup or glycerine. It was used just as in the other cases. He proceeded to demonstrate the adaptability of the process, thus modified, to these surfaces, and succeeded in transferring a number of examples, which were passed round among the audience by Mr. Kent.

Coming to double transfer, Mr. Middleton said that this was very little more trouble than single. Two methods were avail-

able, one for use on surfaces impervious to moisture, and the other for use on pervious surfaces. In the latter case a piece of paper was smeared with a resinoid solution of rubber and dammar, or rubber, dammar and elemi in xylol. The solvent was allowed to dry, then the paper immersed in water with the print, squeegeed together, and left under pressure for a while, and hung up to dry. After drying, the original support was removed, the surface moistened with ether-alcohol to remove traces of wax, etc., and plunged into water until the greasiness disappeared. It could then be transferred on to any surface by means of a gelatinous adhesive, but, of course, if the support was not pervious to moisture the gelatine could never dry. After drying, the temporary support was released by xylol.

For impervious surfaces another procedure was necessary, based on one first suggested by Lumière in their three-colour process. Here the print, hardened with alum, was either coated thickly with soft gelatine solution or squeegeed into contact with paper coated with such solution, and allowed to dry, after which the waxed paper was removed, the print moistened with ether-alcohol, and wetted and squeegeed into contact with the impervious or other surface which had been previously coated with gelatine containing chrome alum. He showed an example of this method, in which the transfer had been made on an opal surface.

After pointing out that in order to finish the prints a vigorous rub with cotton wool or a little wax in turpentine would be found to deepen the shadows, Mr. Middleton concluded with a few words about failures. If the print was squeegeed into contact with too much force or if it was attempted to remove the print before it was quite dry, the wax paper would not leave cleanly, but it would be found that vigorous friction with a rag soaked in xylol would remove the portions remaining behind without danger to the film. Occasionally, again, either through careless manipulation or the presence of too much air in the water, air was enclosed beneath the print, and in this case steaming was the remedy. In any case this was useful when the surface was desired less matt.

Brief questions put by various members elicited the following additional information:—

The prints were all toned before being transferred. The process was not intended for three-colour work. Experiments had been made in this direction, and as a paper could not be obtained which was satisfactory for the purpose intended, the present one was evolved. They had abandoned for the present the attempt to get proper colours by toning. It was not very suitable for enlarging negatives, as when transferred on to glass it left a considerable grain. The prints could be transferred on to drawing paper by this method, in the way recommended for transferring to satin. Damping the drawing paper could be carried out in the ordinary way with gelatine. The gelatine was put in the middle, contact was made, and after a light application of the squeegee it was allowed to dry. The gelatine should be used very weak, a considerable quantity being left on, so that it could "pool down" into the pits of the paper. The transferring could be done on to a very rough paper. There would be no objection to pigmenting by this method, as in the bromide process, but probably it would be necessary to pigment before transferring. This new paper would keep well; some had been kept quite good for four years before printing. The prices were the same as for bromide.

Mr. Middleton, when addressing the Royal Photographic Society, stated that he would publish in his paper a bibliography of the patent literature relating to stripping films. Considerations of space have evidently prevented the Society from publishing this latter, but Mr. Middleton having kindly sent us a copy of his compilation, we are glad to be able to add it to his paper:—

British Specifications Relating to Stripping Films and Papers.

1881.	No.	1,559	Pumphrey
	,,	5,448	Morgan
1882.	,,	2,780	Morgan and Kidd
1883.	,,	1,608	Thiébaut
1884.	,,	13,596	Eastman and Walker
	,,	13,774	Worsnop
1886.	,,	9,460	Brown
	,,	13,580	Cain
	,,	15,727	Foxlee
1887.	,,	2,662	Warneuke
	,,	12,521	Brown
1890.	,,	3,393	Foxlee
	,,	9,893	Swan and Leslie
1895.	,,	10,666	Wellington
	,,	11,821	Wellington
1898.	,,	24,750	Moh and Ors.
1899.	,,	12,152	Macaire
	,,	17,164	Thornton and Rothwell
	,,	17,165	,, ,,
	,,	18,430	Hofmann
1901.	,,	23,551	Soc. Anon. des Produits Photographiques M-Y
1902.	,,	12,818	Fry
1903.	,,	25,390	Hoffsümmer
1904.	,,	925	A.G.F.A.
	,,	3,855	Hoffsümmer
	,,	21,208	Brasseur
	,,	24,774	Bry
1907.	,,	7,132	Lumière
1908.	,,	16,114	,,
1912.	,,	20,556	Kent
	,,	29,616	,,
1913.	,,	5,551	Blondel and Chopin
1915.	,,	12,091	Kent and Middleton
	,,	102,066	Pin

We hope at an early date to be able to publish some notes by Mr. Middleton on the experimental apparatus which can be readily made and can serve for investigation, such as that on which he has been engaged.

PURPLE TONES ON BROMIDE PAPER BY RE-DEVELOPMENT IN DAYLIGHT.

Re-development may be applied to bromide prints for two purposes, either as a means of improving the colour of a faulty print or to change the colour of image by altering the form of the silver image.

I gave a formula for obtaining purple tones in the Correspondence column of the "B.J." of February 7, and have received queries from readers who seem to have a difficulty in getting the required colour. Following the formula given I have toned batches of prints and get any colour from red to purple-black by diluting the re-developer and developing in full daylight.

The prints to be toned should be thoroughly washed and bleached in daylight. Let them stand in the washing water in daylight; keep them moving about in the water face upwards until the image has gained in strength, which should be a pleasing pinkish red colour. Then re-develop with the formula given below, which can be diluted to get the desired colour. As the prints dry darker in tone, development should be stopped before the colour proper, but a little practice will soon show. The prints *do not* require fixing. Some papers may not re-develop with the hydroquinone only; if so, use a very dilute M.Q. developer. Prints developed in the first instance with amidol do not give such good tones as those developed with M.Q. The stronger the actinic light the operations are carried out in the better the result. Then, if after the toning process, you are not satisfied with the colour, no need to waste

a print; well wash it, bleach again, and put it in a sodium sulphide bath, and the usual sepia tone will result, slightly intensified. Gaslight paper does not answer to this process, the only colour resulting is a good sepia tone.

The following processes may be used for the improvement of badly coloured prints, or for toning.

Bleach in one or other of the following bleachers:—

A.—Potass. ferricyanide	140 grs.
Ammonium bromide	180 grs.
Water	10 ozs.
B.—Copper sulphate	½ oz.
Concentrated sulphuric acid	20 minims.
Common salt	½ oz.
Water	10 ozs.
C.—Potass. bichromate	90 grs.
Concentrated sulphuric acid	300 minims.
Common salt	1 oz.
Water	10 ozs.

After bleaching, wash in running water from 20 to 30 minutes, then redevelop in one of the following solutions, in daylight, which will be found satisfactory, and certain in action:—

I.

Metol	45 grs.
Soda sulphite	130 grs.
Soda carbonate	270 grs.
Water	10 ozs.

II.

A.—Hydroquinone	170 grs.
Potass. metabisulphite	90 grs.
Potass. bromide	20 grs.
Water	10 ozs.
B.—Ammonium carbonate	1 oz.
Water	10 ozs.

The following table shows results obtained with the various combinations of bleacher and developer:—

Bleaching Solution Used.	Redeveloper used.	Results.
A	II. (A) 1 part. (B) 1 part. Dilute accordingly.	Deep purple brown, similar to gold-toned P.O.P.
A, B or C	I.	Good black with poor prints.
B	I	Splendid blue black velvety shadows as near a carbon print as possible. Resembles an etching on cream crayon.
C	II. (A) 4 parts (B) 6 parts. Water 2 parts.	Deep brown, fine colour. Whites very clear.
C	II. (A) 1 part. (B) 1 part Water 1 part.	Excellent sepia equal to sulphided print.
C	II. (A) 2 parts. (B) 1 part. Water 2 parts.	Very pleasing, light brown tone.

The developer may be used several times until discoloured.

ERNEST MANLEY.

DEATH OF MR. WELBORNE PIPER.

It is with very great feelings of regret that we announce the death, on Tuesday in last week, March 4, at the age of fifty-five, of Mr. C. Welborne Piper, for a considerable number of years a member of the staff of the *British Journal*, and one of the leading investigators and writers who have taken the processes of photography as a field of study.

Educated for the profession of architect, in which he practised for some years, a serious illness, when he was about thirty, left him in a state of delicate health, which forbade continuous or active occupation, and for the past five and twenty years, first in the home of his parents and latterly in the rooms which he occupied to the time of his death, he led the tepidly busy life consistent with the rather low measure of physical vitality which was his fate. Yet, despite this disability, he produced a very considerable volume of work in writing and experiment. For some years he worked with a brilliant friend, the late Douglas J. Carnegie, to the joint researches with whom the now widely used chromium intensifier is due. Piper himself is perhaps best known by his share in the invention of the Bromoil process. He worked out within a very short time the method by which the image of a bromide print can be converted into one retaining greasy pigment in accordance with the strength of deposit, and the formulæ which he evolved at the outset long remained the standard method of carrying out the process. Among other researches in photographic chemical processes may be mentioned those on the rate of fixation, on the accelerating effects of additions to the

The late C. Welborne Piper.

hypo bath and on the fogging powers of developers, the latter carried out with Dr. Mees in the laboratories of Messrs. Wratten and Wainwright not long before that firm's amalgamation with the Kodak Co. These are but a few of the many minor processes of photography which he made the subject of experiment and in many of which he effected substantial improvements.

But Piper's chief interest lay in photographic optics, of which, though not a mathematician, he had a profound knowledge, and to which he made a number of contributions—for example, in the investigation of depth of focus, the design of depth scales, the correction of distortion caused by tilting the camera, and the design of apparatus for lens measurements. His "First Book of the Lens," written in 1901, is a treatise which, without the aid of higher mathematics, is the most complete account of the properties of photographic lenses which we have, though its title must have misled many a tyro in the subject.

Of an intensely reserved disposition, Piper had few intimate friends, but for them no more loyal associate could be imagined. He was entirely destitute of what is commonly called "side," and even we, who, we think, have known him as intimately as anyone during the past ten years, are uncertain whether we have appraised his intellectual gifts as highly as they merited. But we deplore the loss of the most sincere of friends, and, for photography, regret the passing of one whose chief occupation in life was to extend the knowledge of its principles.

MANACLED EXPORT TRADE.

The two communications printed below reached us within four days of each other. The first is the indictment of the red tape methods of the War Trade Department by Mr. Chas. L. Burdick, the head of a business well known among photographers. The second is a statement by the Department of Overseas Trade, the office jointly administered by the Board of Trade and the Foreign Office, which can be interpreted only as an admission of the truth of the charges against the War Trade Department. Here we have the extraordinary spectacle of one Government department inviting harassed traders to let it try its hand at breaking the red tape with which another Government department is holding back trade with neutral countries. We confess we are highly sceptical of any benefit resulting to the commerce of the country in this way. The incident is surely enough to show that a department which has thus to be interrogated by another body of officials had better be taken over lock, stock, and barrel by somebody who knows its business, and who can do it, before many branches of industry which flourished before the war and are now reviving are handed over to our commercial rivals in other countries.

I.

I am connected with two manufacturing concerns which wish to renew their pre-war trade with merchants in neutral countries, but are practically prevented by Government restrictions.

It looks as though the purpose of the War Trade Department was to hamper British manufacturers until the Germans have had time to organise and occupy these markets.

I should like to say, to begin with, that the goods in question cannot be used for food or in the production of food; they are not of use as raw material or munitions of war; nine-tenths of their value is represented by British labour.

In one case a consignment of goods (for export to Spain) has been held up by the Government for three months because some precious detail of red tape had not been carried out.

These goods had been accepted by the Post Office (a Government department)—even registered—for despatch to Spain, but are apparently now confiscated. We shall probably lose our customer, which is more important than loss of the goods. A Spanish merchant who cannot rely upon us to serve him will buy from the United States or Germany, or someone who can treat him decently.

Re another line of goods which we wish to export to Norway and Denmark. We are told that we must first get from our customer Merchant Guild Certificates.

As indicating the difficulties under which we are trying to do business, allow me to explain the process.

You have an order, let us say, from Denmark for calculating machines (really coin-counting machines, but I wish to avoid the suspicion of seeking publicity); you ask your shipper if he will take the goods; he tells you that you must first obtain a licence from the War Trade Department.

Your first step is to get the forms—this may take you a week (a Government department always takes four or five times as long to reply as a business house would). You are provided with a booklet referring to a "Royal Proclamation" of May 10, 1917, and 34 amendations, all set out in detail. These are further modified by Orders of Council, October 1, 1918, and further amendations. Then follows a list of goods which may, or may not, be exported, or which may be exported to some countries and not to others. You look for your class of goods in the list. They are, of course, not there. This voluminous list (with two or three appendices) has included in it such things as dari, dhol, and mungo, but not calculating machines. However, you think it will save time to apply at once for a licence, but before you can do this you must get your goods in their boxes, or at least ascertain their net and gross weight and the measurement of the boxes. With this you must give pages of information about yourself and your customer, describe your business, how long established, nature of consignee's business, and other details, as set out in a sheet of instructions of some 2,000 finely printed words.

After you feel that you have some insight into this tangle of red tape, you send in the application. You then wait patiently for about a fortnight and receive a printed letter (probably filled in by a junior clerk in the Government department) informing you that you must obtain from your foreign purchaser a Merchant's Guild Certificate from the country in which he resides.

So you must write to your customer, confess that England is under blockade as far as trade with neutrals is concerned, get him to go to the trouble of supplying you with the necessary documents, and then begin all over again with the War Trade Department.

This process will probably occupy three months—your customer may lose patience and cancel the order. In any event, he will welcome the German manufacturers of calculating machines, who, you may be sure, will not be hampered by his Government officials.

We are taking back returned Army men and hoping to find places for others of our old employees who enlisted, but shall have to turn them down if these foreign markets are practically closed to us.

CHAS. L. BURDICK.

II.

(From the Department of Overseas Trade.)

In order further to assist exporters to recover their trade in goods of which the export is or has been controlled, and generally to ensure that no openings for trade are lost to British exporters owing to ignorance of existing export facilities, the Department of Overseas Trade, in concert with the War Trade Department, has made arrangements for bringing to the notice of exporters, through the medium of the Press, trade journals, Chambers of Commerce, and trade organisations, and by special notes direct to firms on the "Special Register" of the Department, information regarding changes affecting control over exports.

Firms not already on the Special Register who desire to receive such information direct from the Department may apply for admission to the Special Register to the Comptroller-General, Department of Overseas Trade (Development and Intelligence), 73, Basinghall Street, E.C.2. The annual fee for admission to the Special Register is £2 2s., which includes the supply of the "Board of Trade Journal."

It is understood that, owing to the necessary formalities and consequent delay in connection with the obtaining of export licences, exporters find themselves at a disadvantage when dealing with orders requiring immediate acceptance. The department will, therefore, on request, undertake to ascertain from the War Trade Department and reply by telegram or telephone at the earliest possible moment whether licences will or will not be granted for such orders. In the event of an applicant being promised a licence he will be enabled to deal with the order straightaway with the knowledge that upon application being made formally to the War Trade Department the licence will be granted.

Inquiries should be by telegram rather than by telephone, and should be addressed to "Orders, c.o. Advantage, Stock, London." They should give, in addition to the name and postal or telegraphic address of the applicant, the quantity, value, and description of the goods comprised in the order and the name and address of the ultimate consignee if the goods are destined for a neutral country. In the case of orders from Allied or British territory, or from territory in the occupation of troops of the associated Governments, the consignee need not be stated; the country of destination will, of course, need to be given. A reply of twenty-four words (1s. 6d.) must also be prepaid.

Applicants are requested in their own interest to confine their inquiries to orders needing a very urgent decision, since the fewer the inquiries the more promptly can answers be given.

FORTHCOMING EXHIBITIONS.

April 17 to May 22.—Hammersmith Hampshire House Photographic Society Annual Exhibition. Two open classes. Joint secretaries, J. G. Abrahams, 41, Hamilton Terrace, London, N.W.8; A. H. Page, 12, Lime Grove, London, W.12.

Assistants' Notes.

The Photography of Cats.

About twenty years ago a photographer living at Ealing came prominently before the public as a photographer of cats; he made them a specialty, just as the late Mr. Thomas Fall, of Baker Street, had some years earlier made a name for himself as a photographer of dogs. But since those charming studies of cats have ceased to come from Ealing no other photographer appears to have made a special study of them. Cats are brought to most studios, it is true, just as babies are, and a photographer may be asked to visit the home of "pussy," but such events are usually looked upon as being just ordinary, and few operators, if any, give a cat more thought—unless it be of the evil variety—than they would give to any other subject.

The picturing of cats appears to attract but little attention. Most of the books about cats are badly illustrated by photography, and to see the best cat pictures of to-day one must turn to the pages of the *Bazaar, Exchange, and Mart*, the issue of which journal for the first Friday in every month deals largely with cats, and the illustrations given therein are reproductions of the finest photographs of cats one is likely to meet with. The majority of the studies are remarkably good, but as the name of the photographer never appears it is impossible for the writer to give praise to the operators to whom they are due.

The lighting of a cat needs care to bring out the animal's points, but not so much care as is necessary with a human being. A good light and plenty of it is permissible, and, in fact, necessary, because of the brief exposures called for. The most important factor in cat work is the choice of suitable backgrounds, and it is in selecting these that the average operator usually comes to grief. A background can make or mar a picture of a cat, and I am inclined to write down the backgrounds of commerce and as used for ordinary sitters as being useless for the work. The most satisfactory plan is to make a series of comparatively small backgrounds of varying colours, using millboard as a base, or, if preferred, light wooden frames covered with cheap calico or similar material. Such backgrounds may measure about 60 ins. x 40 ins., a trifle larger if convenient, but certainly not smaller. The material—millboard or fabric—is then distempered. If six or eight backgrounds of different shades are made the photographer can select the colour that will "show up" the cat to the best advantage.

An ordinary table is perhaps the most suitable place or "throne" on which to pose a cat, and a background with a continuous piece (foreground) which can be placed over the table when the background is set up upon it is an advantage, as it prevents the junction between the background and the table showing in the form of an ugly line across the plate, though the use of a large lens stop usually eliminates the division to some extent.

Cats are not so affectionate or as easily managed as dogs, but cats know their friends quite as well as do dogs, though they are not so demonstrative. A cat wandering about a street will often take notice of some people, but not others, and in so doing rarely, if ever, attempts to make friends with the person who dislikes cats. And having such mysterious knowledge it is obviously difficult for a photographer who is not a lover of "pussy" to pose one in an artistic or comfortable position.

The ordinary bulky studio camera is of little use for the work, because of "pussy's" proclivities for wandering about the table and to the edge of the background. The camera to use with ease and comfort is the reflex, and in the hand. Much, however, depends upon the behaviour of the feline "sitter." As regards posing, the operator must use his discretion and bring his artistic training into play; some cats look best standing up, others lying down, the most difficult being a sitting position. Cats when in a strange studio will stand up or lie down more readily than they will sit. Lastly, banish all accessories, such as cushions, etc., from the picture, as many otherwise very fine studies of cats have been spoilt by cushions, mainly because cats are imitative, and will lay rest comfortably on cushions of their own colour or one very near to it, and when a cat is thus pictured it becomes a difficult matter to know where the cat ends and the cushion begins.—L. T. W.

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Applications, February 17 to March 1:—

Cinematography.—No. 4,156. Moving-picture apparatus. D. Boixeda

Colour Stereophotography.—No. 3,833. Stereoscopic natural colour photography. J. Crawley.

Cinematography.—No. 4,113. Flicker shutter for cinematograph projector machines. W. Diggle.

Lantern-Screens.—No. 4,312. Process for preparing canvas, etc., screens for cinematographs, etc. R. Gilpin.

Cinematography.—No. 4,121. Means for securing ends of cinematograph films. P. Hindmarsh.

Colour Cinematography.—No. 4,131. Device for taking and projecting colour cinematography. K. Kamei.

Cinematography.—No. 3,831. Cinematograph apparatus. C., F. W., and S. M. Portass.

Colour Cinematography.—No. 4,053. Production of photographic films in natural colours. T. M. Sanders and R. Wellesley.

Plates and Films.—No. 4,390. Photographic plates and films. E. B. Smith.

Cinematography.—No. 4,072. Cinematographs. P. Towns, H. Sutcliffe, and J. Wren

Washers.—No. 5004. Apparatus for washing photographic prints, films, etc. B. L. and J. and R. Oldfield.

Cinematography.—No. 4770 Cinematograph film-printing apparatus. R. K. Hearn.

Cinematography.—No. 5168. Cinematograph film-printing apparatus. H. V. Lawley and C. M. Williamson.

Cinematography.—No. 4526. Cinematographs. R. S. McConnell.

Cinematography.—No. 4816. Cinematograph apparatus. W. Ottway and Co. and A. Wood.

Rotary Photogravure.—No. 4653. Rotary photogravure printing machines. W. Pickup.

COMPLETE SPECIFICATIONS ACCEPTED.

These specifications are obtainable, price 6d. each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

Aeroplane Cameras.—No. 121,526 (December 20, 1917). The invention consists in a film camera for aeroplane photography, in which the operations of moving forward the band of film, pressing it in the focal-plane, releasing and resetting the shutter and recording the number of exposures are performed automatically.

The mechanism may be contained in a box *d*, Fig 2, secured to a casing *e* forming a roll-film attachment which is detachable from

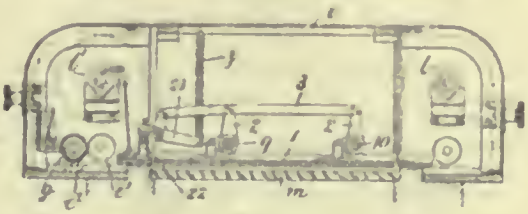


Fig. 1.

or hinged to the camera and has removable ends so that it may be loaded in daylight. As shown in Figs. 3 and 4, a spindle or barrel *a* is mounted in the sides d^1 d^2 of the box *d*, and bears wheels and cams by which the mechanisms are operated, the spindle being driven by a worm-wheel *b* from a shaft *c*. The film is drawn across the exposure aperture by mangle-rollers e^1 e^2, Figs. 1 and 2, and is fed to a take-up spool l^1. The mangle-roller e^1 is driven intermittingly by a wheel *h* on the spindle *a* which has teeth

round about three-quarters of its circumference and gears with a wheel i, a locking rim h^1 extended round the untoothed part of the wheel h and one or more locking sectors k of the Maltese cross type on the side of the wheel i ensuring that the roller e^1 is stationary during exposure. Proper meshing between the wheels h, i may be ensured by the provision of pins at each end of the

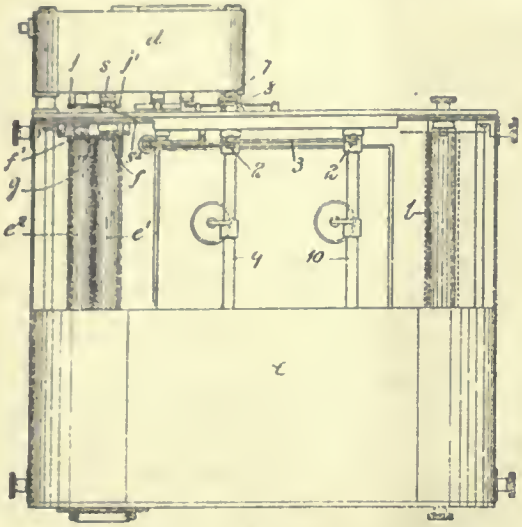


Fig. 2.

untoothed part of the wheel h which engage the radial parts of the locking sector k. The motion of the wheel i is communicated to the roller e^1 through a wheel j which engages a wheel j^1 on the shaft of the roller. The take-up spool l^1 is driven through a friction drive from a wheel o on the spindle a, the drive being through a friction clutch to a wheel p having a crank s on its

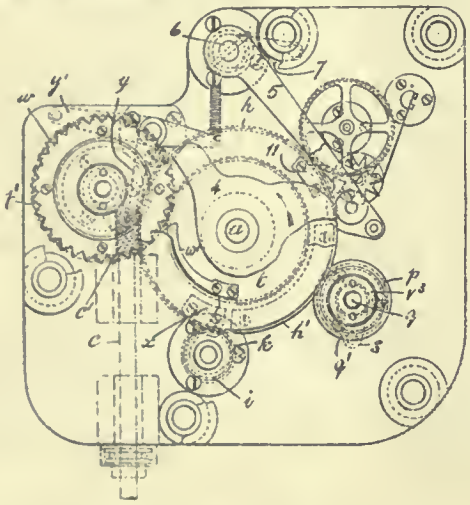


Fig. 3.

spindle which engages a radially slotted arm s^2 on the spindle of the spool.

The shutter may be of the focal plane type and may be adjusted in the usual manner for varying the exposure. It is set through the medium of a partially toothed wheel t on the spindle a which drives a wheel t^1 through a friction drive. A star wheel w on the side of the wheel t^1 is engaged by a finger w^1 when the wheels are about to mesh to ensure proper meshing. The shutter is released while the wheels t, t^1 are out of mesh by the operation of a cam x upon the end of a lever y which moves a lever y^1 connected to the shutter release. Alternatively, the shutter may be of the between-lens type and be set and released through Bowden wires from levers operated by a cam or cams on the spindle a. The film is pressed against a transparent plate m during exposure by a plate 1 which is raised against spring pressure during the film-shift by means of levers 2 and links 3, the spindle 9 and a spindle 6 being connected by means of an arm 7 bearing a pin, and a slotted arm 8 on the spindle 9, and the spindle 6 being turned through a lever 5 by a cam 4. A punch 22 for perforating the film between exposed parts may be provided, and may be operated through a bell-crank 23 fastened at one end to a spring z and linked at the other end to a lever 2. Means for indicating the number of exposures made may be driven by a pin 11 or by a lever and cam, and a counter dial may be mounted in front of the pilot's seat when the camera is used on an aeroplane and be

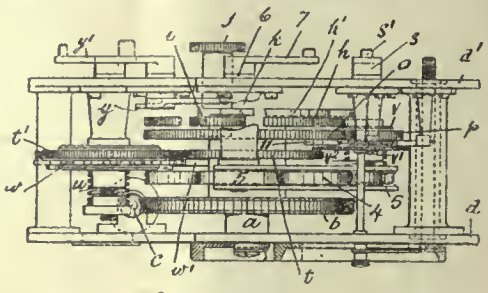


Fig. 4.

operated by a Bowden wire from the camera. Means for stopping the mechanism after each exposure may comprise a pin on the wheel b in the path of which a stop may normally project, the stop being capable of being withdrawn when desired by a hand-grip release operating through a Bowden wire. A slipping friction-drive may be arranged between the motor and the wheel b. According to the provisional specification, means may be provided for automatically stopping the mechanism when a roll of film has been completely exposed, such as a trip-lever throwing out a spring clutch in the motor drive, or means for breaking the circuit of the current to the motor; the film may be shifted by mechanism which starts its movement slowly and gradually increases its velocity until it attains a maximum, and then gradually decreases; and the shutter may be set by a pawl and ratchet mechanism. Harold Workman, 12, University Gardens, Kelvinside, Glasgow.

Analecta.

Extracts from our weekly and monthly contemporaries.

Curing the Smoke Trouble in Flashlight Work.

Having to make many flashlight exposures for business purposes all the year round (writes Mr. H. G. Grainger in the "Amateur Photographer and Photography" for March 12), it became necessary to devise some means for trapping the smoke after the powder has been fired, the idea being to confine the smoke in a suitable receptacle and release it later outside the house. The appliance takes the form of a box in which the flashlight can be fired. The box was bought at the grocer's, the measurements being 24 ins. by 16 ins. by 13½ ins. deep, *i.e.*, front to back.

The box is lined with white asbestos, which serves the double purpose of fire prevention and reflecting the light. In the centre of the bottom is a tin box lid for the flash powder, in the middle of which a small piece of touch paper is placed in an upright position. The front of the box is a door hung on hinges, on the inside edges of which are strips of velvet.

At about the centre of the lower edge of the door of the box a brass spring catch is fitted, which works in such a manner when the door falls after the flash has taken place, by engaging its complementary part fixed in the middle of the front edge of the bottom of the box, thereby effectually keeping the smoke inside. The box is then carried into the open air, and, the door being opened, the smoke issues in a rush and vanishes at once.

On a couple of rods of light wood a muslin diffusing screen hangs from the lower edge of the door by a couple of picture rings at the ends. By the use of these rings the screen is detachable, so that previous to the work being commenced the muslin can be soaked in water to obviate the danger of fire.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

MONDAY, MARCH 17.

Bradford Photographic Society. Demonstration. "Gum Bichromate." J. H. Leighton.
Dewsbury Photographic Society. "Carbon Printing." J. Garside.
South London Photographic Society. "Practical Intensification and Reduction." N. F. Horne.

TUESDAY, MARCH 18.

Royal Photographic Society. "Finishing Bromide Prints." N. F. Horne.
North Wilts Field and Camera Club. "Flower Photography." G. W. F. Thomas.
Hackney Photographic Society. "Versatility," illustrated by Prints. R. H. Lawton.
Chelsea Photographic Society. Dark Room.
Birmingham Photographic Art Club. "Passe Partout Framing." S. J. Ford.
Manchester Amateur Photographic Society. Ladies' Evening.

WEDNESDAY, MARCH 19.

Croydon Camera Club. "The Defects and Imperfections of Photographic Apparatus and Materials." J. Walker.
Donaldstown Amateur Photographic Association. Competition: Portraiture.

THURSDAY, MARCH 20.

Liverpool Amateur Photographic Association. "Nature's Fly Traps." F. M. Duncan.
Brighouse Photographic Society. Y.P.U. Portfolio of Prints.
Huddersfield Naturalist and Photographic Society. Lantern Lecture, "York." Mr. Dawson.
Hammersmith (Hampshire House) Photographic Society. "Passe Partout Framing." M. P. Black.
Rodley and District Photographic Society. Monthly Competition: "Still Life."
Wimbledon Camera Club. "At the Zoo." J. C. Coffin.
Tunbridge Wells Amateur Photographic Association. "Here and There." H. Wild.
Richmond Camera Club. "Personal Practice in Lantern-Slide Making." D. Johnson.

ROYAL PHOTOGRAPHIC SOCIETY.

MEETING held Tuesday, March 11, Mr. W. B. Ferguson, K.C., in the chair.

Mr. W. B. Appleton, of Messrs. Taylor, Taylor and Hobson, read a paper on "Improvements in Lenses for Aerial Photography," in the course of which he laid emphasis upon the importance to the lens maker of knowing the precise requirements of the user of the lens and the particular qualities which were desired. In the early days of the supply of lenses for use on aeroplane cameras it was explained that the quality on which the Royal Air Force set great store was, in addition to acute definition, a certain "relief effect," which perhaps could best be further described as brilliancy of image. Having that requirement stated to them, his firm were able to study the question, and their researches led them to obtain the wished-for result by a further correction of the coma of the lens. The work done by one of their mathematicians, Mr. A. Warmisham, had made it possible to produce a lens which in its reduction of comatical error had been found by most searching tests to be superior to the Zeiss Tessar. Mr. Appleton here, by means of a very ingeniously constructed model, explained the nature of the production of comatical error in the lens, namely, by the spherical aberration of highly oblique pencils, and pointed out the complexity of the calculations which were necessary for its removal. He showed comparative photographs taken by the Cooke Aviar and the Zeiss Tessar of equal focal lengths and relative aperture, the coma defect of the former at angles of 15 degrees and 20 degrees being very markedly less than that of the latter; and he then proceeded to show the actual performance of the lenses in this respect by means of a projection apparatus. Independent test charts photographed with the respective lenses by the Royal Air Force, in the course of tests of lenses supplied, were seen to agree with these observations; as instancing the high perfection of definition which resulted from the removal of coma, the lecturer mentioned photographs taken at a height of 3½ miles with a 4-in. Cooke Aviar in which the presence of barbed wire could be detected.

A further short paper was read by Mr. Hasselkuss, of Messrs. Ross, Limited, on the modifications made in the Ross Xpres lens for use in aerial photography. In the standard pattern of Xpres lens the corrections for coma and astigmatism were so made that in using a lens at an angle of, say, 60 degrees the definition in the margins of the field would be somewhat better than in the midway zone. Thus, when such lenses were used at the narrower angle employed in aeroplane photography the less highly corrected portions of the field fell around the margins of the plate. They had, therefore, modified the construction of the lens so as to yield a uniformly high comatical and anastigmatic correction over an angle of 36 degrees. He showed photographs in which the critical definition over this angle was uniform. A second model of lens working at an aperture of $f/6$ was constructed from only two types of glass, and, though limited to these optical materials, the performance, as shown by photographs, was of a very high order.

In a brief discussion, Mr. Conrad Beck referred to the common fallacy that a lens which fulfilled the sine condition was necessarily free from coma. The misconception was due to disregard of the behaviour of oblique pencils. Lieut. Jennings gave some particulars of the photographic camera made in the form of a Lewis gun and of very great value in the training of air pilots in machine gunnery.

On the proposition of the Chairman, the hearty thanks of the meeting were accorded to the lecturer.

CROYDON CAMERA CLUB.

MR. G. A. ARDASEER, an ever-welcome visitor, last week gave a lantern-lecture on "More Curiosities Seen Under the Microscope," a title, he said, which was an improvement on the one sent to the secretary. Curiosities, of course, need not be microscopic, and, if memory serves aright, the "Walrus" once defined the members as a weird collection of human oddities. True, at the time he happened to be under sentence of death by boiling oil for making an unfortunate mistake in the day on which the weekly meetings are held, and this may have coloured his vision. As pointed out by a member, perhaps the only thing appertaining to the club which might repay microscopic examination is its reputation, but the high power required introduces difficulties hardly worth encountering with success so problematical.

"*Curiouser* and curiouser!" cried the immortal "Alice in Wonderland" when she found herself "opening out like the largest telescope that ever was." What she would have exclaimed may be left to the imagination if she had seen the leg of a dragon-fly the size of a tree trunk, not to mention the many other tiny people and things "opened out" by Mr. Ardaseer. And little Alice would have understood quite well his delightfully clear explanations of the superb slides shown, for he does not believe in associating a dead language with the depicted defunct unless compelled. For instance, when differentiating between diatoms, instead of the usual terrible identification labels, what could be happier or clearer than pointing with the stick to that "triangular bloke there."

Without doubt the most interesting slides illustrated the daffodil disease, which in one district alone caused a loss of £150,000. It does not confine its ravages to daffodils, but extends to other plant and vegetable life, and can be starved on barren soil for five years and come up smiling at the end of the fast. When the lecturer was approached by the Royal Horticultural Society to investigate the matter, little more was known beyond the fact that minute worms were the cause of the trouble, and it was only after close study for a long time that their life habits were revealed by this Sherlock Holmes of the microscopic world. No cure has as yet been found, but it is to be hoped that some bacteria will be discovered with a fine appetite for this particular spread.

One little marine insect shown Mr. Ardaseer said he approached with some diffidence, as its habits were extremely bad, and its name was "Harper." Eventually it lost its tongue. "Then it is certainly no connection with our 'Harpur,'" emphatically observed a member, and the lecturer looked relieved. Dealing with succulent slugs, who are almost exclusively vegetarians in fact, and also in aspect, for they hardly look like beasts of prey, he said one variety, usually killed by gardeners, is their best friend, for it devours worms and other pests. A most hearty vote of thanks was accorded Mr. Ardaseer for a lecture listened to with intense interest. His way of starting with "Gentlemen, including the President," is a neat method of escaping the invidious inference contained in the customary formula.

Friends of Mr. A. F. Catharine (past-President) will learn with great regret that, from the symptoms described, his favourite dog is undoubtedly suffering from the daffodil disease.

MIDLAND RAILWAY INSTITUTE PHOTOGRAPHIC SOCIETY.—At the annual general meeting on Monday, March 3, the President, Mr. W. N. Bancroft, in the chair, the annual report and statement of accounts were adopted, the latter showing the society to be in a

sound financial condition. Officers for the coming season were elected as follows:—President, Mr. J. E. Anderson; vice-presidents, Messrs. R. W. Reid, F. J. Greasley, and T. Ward; hon. sec., Mr. C. Gadsby Thorpe; hon. treasurer, Mr. T. A. Luxford; hon. auditor, Mr. J. J. Hennessey; Committee, Messrs. Bell, Caulkin, Pegg, Dallman, and Hammersley. Mr. H. C. Cross, secretary of the Leicester Photographic Society, then gave his lecture, "Holidays in Derbyshire and Devonshire," which, with its accompanying lantern slide illustrations, was very much enjoyed. A hearty vote of thanks was accorded to the lecturer. Mr. R. W. Reid then proposed a vote of thanks to the retiring president. He said Mr. W. N. Bancroft had been president of the society since October, 1917, and though there were many other claims on his time, he had maintained a keen and helpful interest in the society. All would regret Mr. Bancroft's retirement, but in Mr. J. E. Anderson he would have a very able successor who had always been active for the society's good since its inception. The hon. secretary seconded Mr. Reid's proposal, and the vote of thanks was passed with much enthusiasm. There are now 170 members of the society, an increase of ten during the past year. Upwards of forty members have served with his Majesty's Forces in the war, and three have made the supreme sacrifice. A Roll of Honour is being prepared and will be hung in the Institute. The Hon. Secretary announced that efforts will be made to revive the summer excursions and the annual exhibition, and for the next winter session it is hoped to arrange some evenings for the benefit of beginners in photography, in addition to the usual lectures and demonstrations to be provided.

Commercial & Legal Intelligence.

NEW COMPANIES.

Doncaster Rotophone Co., Ltd.—This private company was registered on March 5 with a capital of £2,000 in £1 shares. Objects, to carry on the business of and employ, as far as possible, the shareholders in the company in producing by mechanical and other means, photographic view cards, birthday and other cards, photographers, etc. First directors:—W. A. Roelich, 18, Oxford Place, Doncaster, photographer; J. Simonton, 27, Young Street, Doncaster, photographer; and B. H. Gray, 3, Hall Gate, Doncaster, law student. Registered office, 6a, St. George Gate, Doncaster.

News and Notes.

Silvering Mirrors.—Writing to the "English Mechanic," Dr. Charles C. Godfrey, of Bridgeport Conn., gives the following directions for silvering glass, by the Lundin method:—

(1) Make a stock solution of nitrate of silver which shall contain 5 grains to each fluid drachm of distilled water.

(2) Make a stock solution of pure formaldehyde which shall contain 10 minims to each drachm of distilled water.

(3) Make a saturated solution of chloride of tin (pure stannous chloride) in distilled water.

Determine the amount of fluid necessary to cover the surface of the mirror when in the silvering dish to a depth of ¾ in., silvering face up.

Use 2 drachms of the stock silver solution and 2 drachms of the stock formaldehyde solution to each fluid ounce of the required amount of silvering solution as thus determined.

Having removed the old coat of silver with nitric acid and washed the surface, take a large wad of surgeon's cotton soaked in chloride of tin solution and rub the surface of the mirror thoroughly with it, then, holding the mirror under a stream of water, continue to rub until all the tin chloride is removed from both cotton and mirror.

Now cover the mirror, in a dish, with water about 20 deg. F. warmer than the temperature of the air. Ordinary water from the tap will do.

Prepare the silver solution in the usual way with aqua-ammonia until the precipitate formed is nearly dissolved, and add water to make one-half the required amount of silvering solution.

Take the requisite quantity of formaldehyde solution in another vessel and add water enough to make the other half of the required solution. Now place the mirror in the silvering dish. Mix the silver and formaldehyde solutions thoroughly, and quickly pour over the surface of the mirror.

It is not so necessary with this method to have distilled water as with the potash method. Rain water, or, in many localities, surface or reservoir water, will do as well, but it is advised to try it out on a small scale first to see if the water is suitable.

I believe that the use of the chloride of tin is to remove any film of oil or grease which may be on the surface of the mirror, which it does beautifully and leaves the surface so that it remains wet all over when stood on edge.

It is essential that all tin chloride be removed from the mirror, however, or the silvered surface will be mottled.

I find a cheap pair of rubber gloves prevent soiling of the hands and preserve the surface of the mirror from finger marks.

Mr. Lundin surrounds his mirrors with a band of heavy bandage soaked in beeswax and tied on. This prevents any portion of the mirror being silvered except the surface. This causes some saving in the quantity of silver required, but as this is not a heavy item where one mirror is to be coated, I prefer the usual method of using a dish slightly larger than the speculum, coated with paraffin wax. Besides, it is claimed that a mirror retains its figure better with changing temperature if silvered all over. Always silver with the face of the mirror up.

I am under the impression that the silver surface thus produced is harder and more durable than that produced by other methods, besides not requiring quite as careful manipulation.

Correspondence.

**** Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

**** We do not undertake responsibility for the opinions expressed by our correspondents.*

CINEMATOGRAPH OR KINEMATOGRAPH.

To the Editors.

Gentlemen,—I question whether Mr. Lockett is right when he says it is the general rule in English words derived from Greek beginning with or containing *k* to convert *k* into c, although in those words which have come from Greek through Latin the change no doubt is sometimes made. But it is not a matter of spelling only; it is also one of pronunciation. Many Greek-derived words, when spelt with c are pronounced *k* (camera), while in some the *c* is soft (centre), both of which come from Greek through Latin. There is no rule.

But there are several words which come direct from Greek in which the *k* is not converted; Kilo, kaleidoscope, katabolism, kerosene, and (more to the point) kinematic and kinetic. These last two were established in the language before the word in question—which is compounded from them—was required, and to prove only patriotism seems hardly an adequate reason for departing from its proper spelling; or, if it must be spelt c out of politeness to our Ally, for the cacology of pronouncing it s.—Yours truly,

Epsom, March 8, 1919. Travers J. Briant.

PHOTOGRAPHY OF THE ROYAL ENGINEERS.

To the Editors.

Gentlemen,—It was with interest I read of the doings of the R.E.s in the great war. May I, however, be permitted to add another branch of photographic work carried out by that magnificent corps which is not known at all by the general public, if even in the photographic world. I refer to the taking of photographs recording progress of such huge works as the construction of the train ferries now running so successfully between this country and France, the construction of that new Kent port of Richboro, numerous aerodromes, and last, but not least, the National shipyards at Chepstow, Beachley, and Portbury.

It was my good fortune when in khaki to be actively connected with that work. To record progress weekly of such huge works has entailed a gigantic amount of work and skill. The demand of the big folks up in London to see the actual progress at intervals was no better portrayed than by photographs. The work of taking

these photographs has often rested with one or two men at each job, and the difficulties in obtaining suitable accommodation have at times been enormous. Barren spots devoid of houses, water, artificial light meet the photographer on his arrival. Still, the photographer has to get to work before the actual progress starts, to show what the place was like to commence with, and despite all these drawbacks, photographs have to be taken, developed and printed on the spot and despatched quickly to H.Q. Together with the carrying of equipment, generally a 12 by 10 outfit, the climbing about to get advantageous positions, makes the lot of the photographer by no means a pleasant one to commence with. With time, however, conditions improve, and the work of recording the progress becomes more and more interesting.

As your correspondent remarked, the Air Force has got all the plums, but, after all, the R.E.s have done an enormous amount of work, and have done it well, too.

FRANCIS H. STOCKIL.

THE ASSISTANT QUESTION.

To the Editors.

Gentlemen,—As the present correspondence on this subject has the appearance of closing, through lack of interest, I should like to add one or two observations before the end comes.

Reviewing the whole matter broadly, I believe there are many who will welcome the disappearance of this topic from the columns of your interesting paper. No doubt there are many employers who honestly would be sorry if any scheme for the standardising of efficiency, as applied to assistants, came into vogue. Also there are many assistants who have no keen desire to train or to qualify further.

The reasons for these attitudes are quite apparent, and, stated roughly, are as follow:—Those employers either do not want skilled assistants, or they do want them at the price of unskilled labour. Those assistants believe that a union of photographic assistants would secure to them all the advantages of self-advancement without any personal effort or achievement.

The opinions and suggestions of assistants who wish to secure advancement by merit are, I believe, being collected by Mr. Marcus Adams. Are the employers who require the services of such assistants giving him the necessary support to enable him to form a basis for a clear scheme? Of course, there is no definite indication that they are prepared to entertain seriously any scheme at all, and one can only hope that Mr. Adams will not labour in vain.

Glancing again over this correspondence, I think employers have contributed very little sound matter to it. The letters of those who have contributed are not convincing, and not one has clinched his points. If assistants are declared to be inefficient, it is surely time that proof be established, and we all know where we are. It is not just to us, who are assistants, to have our abilities submitted to a test which is individual, variable, and evidently ethereal. If there is no recognised degree of efficiency to be attained, it should not be a matter for complaint that it is lacking. An unwritten law of efficiency is neither desirable or practical.

Inefficiency in some applications is undoubtedly an economical abstract. I do not apply that generally, for I know that in photography to-day there are people who lack even elementary knowledge. But they are there, and they live. Yet the responsibility for those people does not rest with assistants. Similar disasters might overtake chemistry, engineering, or even banking, if employers and associations became lax and apathetic.

Undoubtedly unless firm action is taken, at some not distant period, photography as a profession will cease to exist. Skilled assistants will become an unknown quantity, and the future masters of the photographic art will be created for the unskilled assistants of to-day.

To demand skill and to recognise it is to build up a profession, which will be able to pay salaries in accord with its claims as a profession. Without that demand for skill and its recognition, a union of photographic assistants, irrespective of skill, is bound to come as the only means of securing a living wage. Those two ways of advancement I commend to all who think seriously, if they are worth consideration.

Thanking you for your courtesy in publishing these letters.—Yours truly,

ROWLAND SAMMS.

Reigate, March 4, 1919.

Answers to Correspondents.

SPECIAL NOTICE.

In consequence of general reduced supplies of paper, as the result of prohibition of the importation of much wood pulp and grass, a smaller space will be available until further notice for replies to correspondents.

Moreover, we will answer by post if stamped and addressed envelope is enclosed for reply: 5-cent. International Coupon, from readers abroad.

The full questions and answers will be printed only in the case of inquiries of general interest.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

POSTCARD.—If of late pattern, with outside diffusion adjustment, about £13.

G. C.—This apparatus came largely from America, and now, in common with other photographic goods, is among the prohibited imports. We should think your best chance of getting one would be from one of the secondhand dealers.

J. C.—We are afraid that your description of the two Clement and Gilmer lenses is still a little vague. We should say that the shorter focus lens is one that was sold as a half-plate and the other as a large cabinet or whole-plate. It is difficult to estimate the value, but we have lately heard of one of the larger size being sold by a dealer for £5, and the other would, we should say, in like proportion be worth about £4. We think you should have no difficulty in getting three guineas for the aerograph.

V. E.—Addition of acetic, nitric, or oxalic acid destroys more or less the setting qualities of the gelatine, and thus renders the gelatine more soluble. But, of course, by treating it in this way you reduce the setting properties of the jelly. We know of no way of increasing the solubility of the gelatine without doing this. You might try several small additions of chloral hydrate, but we think that with this also you destroy the jellifying property. The maker of emulsions usually does what you seem to have in view by mixing soft and hard gelatines together.

T. S. STEWART.—The fixing bath which is the most rapid in action is one containing 8 ounces of hypo per 20 ounces of water, together with some ammonium chloride. The quantity of the latter is not very material, but one to two ounces would be sufficient. Except for the greater speed with which the emulsion is dissolved out of the plate in the first instance, there is no advantage in the use of fixer containing ammonium chloride: on the other hand, it is possible that a bath of this kind, as it becomes exhausted, acts less satisfactorily than one containing hypo only.

G. H. B.—The best firm in the portable studio trade is Messrs. Boulton and Paul, Norwich, but it is very doubtful if they can supply at the present time. You might try having the studio made locally if you can find a builder who does not speak of wood as though it were gold, but we should certainly think that your best chance of getting a studio at a moderate price would be through a small advertisement in our columns. With the progress of demobilisation of camps in this country we imagine that there must be a fair number of these studios changing hands.

F. P.—For extremely fine grain it is necessary to use the finest grade of carborundum powder, such as you can buy from Messrs. George Adams, 255, High Holborn, London, W.C., but even this will not be sufficiently fine for your purpose until you have got rid of the coarser particles in it by stirring up in water, allowing the coarser elements to subside, then pouring off the other and allowing the fine carborundum to settle. 2. Ply wood can be

bought in small quantities from any of the depôts of Messrs. Hobbies, Ltd.; the address of one is 65, New Oxford Street, London, W.1.

S. B.—You will certainly find the half-watt lamps simpler in use than the arcs, and we should say that four 500 c.p. lamps will do all you require. These should be fitted with reflectors so as to throw all the light possible upon the white screen. It is very necessary to run the lamps at their full voltage to secure an actinic light. A slight drop in the voltage hardly affects the visual value, but may increase the exposures by 25 per cent. Have you looked into the question of using the "gridiron" pattern of mercury vapour lamp? This illuminates the negative by direct light, and is much in favour in the United States. It is made by the Cooper Hewitt Westinghouse Co., 80, York Road, King's Cross, London, N.

G. L.—The only book of instruction in collotype is "Photo-Mechanical Processes," by W. T. Wilkinson, price 4s., from Messrs. Hamptons, Cursitor Street, E.C. But it would be impossible to qualify yourself for practical collotype work merely by learning the subject from a book. You would require a course of practical instruction such as is available at the L.C.C. School of Photo-Engraving, Bolt Court, Fleet Street, London, E.C. After such a course, the working of the process should not be beyond the capacity of anyone of reasonable photographic experience.

P. B.—We have no opportunity of discovering the precise formulas you seek from the "Photographic Bulletin," but the customary method of sensitising silk is first to immerse it in a solution of salt and gelatine. The Iceland moss which you mention is an alternative to the gelatine, which does not possess, so far as we know, any appreciable advantage. The solution is:—Water, 10 ozs.; common salt = sodium chloride, 100 grains; gelatine, 20 grains. This solution is made with the aid of heat, and, after saturating the silk, the latter is stretched on a frame and, when dry, brushed with a solution of silver nitrate, 40 grains to the ounce. After again drying, it is ready for printing.

J. E.—1. A licence is necessary from the Ministry of National Service for starting a new retail business, but we think you will have no difficulty in obtaining it. You require to write to the Director of National Service, 84, Westbourne Terrace, Paddington, N.W. 2. No reason whatever why you should not call your studio the "Royal" providing you do not display any sign resembling the Royal Arms. 3. Photographers' studios are subject to the provisions of the Shops Act so far as concerns the studio and parts of the premises where the public are received. The Act itself provides no limit as to the lateness of closing, but makes it compulsory to close the studio for one half-day in each week.

ARTIFICIAL LIGHT.—I am about to commence a photographic business, and would be much obliged to have your advice on the lighting of my studio, the size of which is 16 ft. x 7 ft. I can only use artificial light, and intend to have half-watt lamps. Can you tell me the candle-power and number of lamps required, and in what position to place them? As I have only 7 ft. across the studio, does this distance allow for a good lighting effect for taking portraits up to cabinet size?—B. H.

The width of your studio is so small that it is difficult to say what would be the best arrangement, but we have found a single Westminster arc lamp to answer well in one nearly as small. Either that or two 1,000 c.p. half-watt lamps should be sufficient if placed near the wall about 6 ft. from the background and 7 ft. high. Use thin white calico as a diffuser and if possible a circular head-screen.

T. A.—We quite agree with you in trying to do without flash-light, but if the studio is at all on the small side you are under the difficulty, when using gas alone, of making it very hot if it is necessary to keep the light burning for any large proportion of the time. On the other hand, when using flash powder, you have the drawback of generating smoke if much use is made of the lamp. There are two good lamps—the "Howellite," of Messrs. J. J. Griffin and Sons, Kingsway, W.C., and the "Powerfol," of Messrs. Kodak, Ltd., Kingsway, W.C. There is also a combined flash and gas lamp made by the Tress Company, 4, Rathbone Place, Oxford Street, W.1. The only other alternative, apart from the electric light installation, which would cost probably anything from £200, is the paraffin mantle lamp of the Blanchard Oil Lamp Co., 151, Farringdon Road, E.C.1, but if you can get gas there is little reason for considering this latter.

C. O.—1. Assuming that you will not work larger sizes than whole-plate, and that the bulk will be cabinets, we should recommend a lens of 12 or 13 ins. focal length with a maximum aperture of $f/4$. Ross No. 3 cabinet, Dallmeyer 2a, or perhaps 3b (this is about 11 in.), or a Cooke Series II.a 12 in. The prices of such lenses now range from about £18 to £25. If obtainable secondhand, they will cost about 25 per cent. less. Lenses of less well-known makes may be picked up at a dealer's for £7 to £8, but these should only be bought after testing. 2. With regard to a studio camera, we can only refer you to makers' catalogues, and, after consulting them, we are afraid you will find some difficulty in getting a new instrument. The second-hand dealers can sometimes supply, but just now there is a dearth of studio cameras and lenses. Messrs. Watson and Sons and Marion and Co. list excellent models, while American styles can be seen at Messrs. Kodak's, Kingsway, and the Anseo Co., 143, Gt. Portland Street, London, W.1

C. E.—1. We recently put your query to a manufacturer, and he said Nature herself cannot make colours to stand the bleaching action of light. Pigments or mineral colours mellow down. Although improvements are being made and research work is keen, no manufacturers will give a guarantee with a particular dye that it is absolutely permanent for all time. For your purpose there are about twelve excellent colours classed as "fast" to light. These have been and are most largely used for colouring. Dyes sold in packets for cotton and woollen goods are not so suitable as those selected for gelatine. 2. "Dark blue and black water colours" we presume refer to Antwerp or Prussian blue and ivory or blue-black, which, being transparent, require a homeopathic dose of Chinese white to give them body or covering power. You will also have to stipple the colour to get the modelling required and hide the sepia base. If you are using Seltona paper, it saves time afterwards to paint a blue dress or a black coat with strong salt solution before fixing. You do not state the make of paper, but we gather by the word "take" your paper is greasy, in which case ammonia water, oxgall, or quillaia will correct it. Glycerine and alcohol is helpful for some papers. Varnish with this, let dry, and apply your tints. For glossy collodion papers try varnishing with a mixture of borax and gum arabic, or for dye work size the print with ¼ oz. gelatine in 5 ozs. warm water, allow to harden, then work on that. Further useful hints on colouring are given in "B.J.A.," 1919, pages 297 to 301.

The British Journal of Photography.

The Oldest Photographic Journal in the World.

PUBLISHED EVERY FRIDAY. ESTABLISHED 1854. **PRICE TWOPENCE**

TERMS OF SUBSCRIPTION, POST FREE.

UNITED KINGDOM.—One Year, 10s. 10d.; Six Months, 5s. 5d Three Months, 2s. 9d.

CANADA ... ...
AUSTRALIA ... ...
NEW ZEALAND ... ...
SOUTH AFRICA ... ...
UNITED STATES OF AMERICA
SOUTH AMERICA ... ...
INDIA AND FAR EAST ... ...
CONTINENT OF EUROPE ...

One Year.

Thirteen shillings (13s.), or 3 dollars 17 cents, or 16 francs 38 cents, or 6 roubles 15 copecks, or 9 rupees 12 annas, or 6 yens 30 sens.

FEDERATED MALAY STATES, BORNEO AND SARAWAK 5 dollars 57 cents.

HENRY GREENWOOD & CO., LTD., Proprietors and Publishers, 24, Wellington Street, London, W.C.2.

IMPORTANT NOTICE TO READERS.—Until further notice agents will supply the "B. J." to order only, as the acceptance of "returns" by a publisher is now prohibited by the Government. It is therefore necessary in order to ensure the regular delivery of the "B. J." each week to place an order definitely with a dealer, newsagent or bookstall clerk, or to send a subscription to the publishers.

THE BRITISH JOURNAL OF PHOTOGRAPHY.

No. 3072. Vol. LXVI. FRIDAY, MARCH 21, 1919. Price Twopence.

Contents.

	Page		Page
Ex-Cathedra	137	Patent News	145
A Question of Hygiene	138	New Books	146
The British Achievement in Aeroplane Cameras	139	New Materials, etc.	146
Practicus in the Studio. By Practicus	140	Catalogues and Trade Notices	146
The Photographers' Assistant. By D. Charles	142	Meetings of Societies	146
The Air Raids on London	143	Commercial and Legal Intelligence	149
An Out-of-View of the Solicitation System	143	News and Notes	149
Forthcoming Exhibitions	144	Correspondence— Cinematograph or Kinematograph—The Assistant Question	150
Assistants' Notes	141	Answers to Correspondents	151

SUMMARY.

A note of the successive changes in plate prices will be found on page 149.

Photographic goods, including plates and papers, may now, so it is announced by the Board of Trade, be exported without licence to all non-enemy destinations. (P. 144.)

An account of the successive patterns of camera which have been employed in aerial photography by the Royal Flying Corps during the course of the war is contained in an article on page 139. A changing mechanism actuated by a propeller on the aeroplane, and a film camera operated by similar means, are among mechanical devices which worthily rank with others of the war.

At the Royal Photographic Society on Tuesday evening last a most admirable demonstration of the finishing of bromide prints by working up with Conté crayon powder was given by Mr. Newman F. Horne. (P. 146.)

A list of the premises connected with photographic and allied business which were damaged during the air raids on London is given on page 143.

In a leading article we deal with a few of the considerations which ought not to escape the constant thought of every master photographer—namely, those which make for hygienic conditions in workshops. (P. 137.)

In this week's article "Practicus" deals with the equipment of the professional photographer's printing room, instancing the advantage of very ample accommodation in the way of sinks. (P. 140.)

Some peculiarly choice specimens of the cadging letters written by photographers adopting the system of promiscuously offering free siddings are contained in part of an article which we quote from our contemporary, "The Advertisers' Weekly." (P. 143.)

The assistant question comes in for some more than ordinarily thoughtful consideration this week in the shape of the article on page 142 and letters on page 150.

A characteristic tribute to the late Mr. Welborne Piper is part of the report of the Croydon Camera Club's meeting last week. (P. 148.)

Some of the precautions which continue to be brought to our notice as necessary for the safe packing of a negative transmitted by post are the subject of a paragraph on page 138.

Much of the vibration of a camera carried on a push-bicycle or under cycle can be avoided by laying a thick strip of felt on the cycle carrier and a similar piece at the bottom of the camera case. (P. 138.)

On many occasions, particularly in interior work, advantageous use may be made of a flash-lamp, or flashpowder, as auxiliary lighting. (P. 137.)

EX CATHEDRA.

Cheaper Plates. It is announced that the prices of dry-plates have been reduced as from March 11th last. The reduction brings quarter-plates to 3/- per dozen, half-plates to 6/6, and whole-plates to 12/3. Taking the quarter-plate as the basis of comparison it will thus be seen that the reduction to 3/- from 3/8, which was the figure reached at the last rise on August 1st, 1918, amounts to a fraction over 18 per cent. The present price of the quarter-plate, in comparison with the pre-war figure of 1/3 per dozen, is still 140 per cent. higher. The schedules issued by the plate-makers give the complete figures of prices for extra rapid and ordinary plates, panchromatics and X-ray plates in both the English and metric sizes.

* * *

Supplementary Flashlight. Photographers as a whole are not fully aware of the advantages that flashlight has to offer as a supplementary illuminant when making exposures under difficult conditions. It sometimes happens that a certain amount of day or artificial light is available by which the exposure has to be made—that is, insufficient of itself to light certain portions of the subject sufficiently for them to be fully exposed before the more brilliantly illuminated parts were hopelessly over-exposed. It is under conditions like these that the flash-lamp, which need only be of a simple form, or which may even be dispensed with if the prepared powder, such as Johnsons, is employed, becomes of real assistance in solving the difficulty. We may, in explanation, cite an instance of this which occurred in our own work some years ago. The subject was an interior of an ancient abbey, the building badly lit through stained glass windows, two of which were directly facing the camera. The details of these windows, which were, of course, fairly well illuminated, were required in the negative together with a good rendering of some dark oak choir stalls in the foreground which were very badly illuminated indeed. A plate was exposed by meter for the windows, and just before this period was complete a strong flash was fired, sufficient to illuminate the whole of the interior. Careful development produced a negative that was "just right" for its purpose. The flash should be fired almost at the end of the exposure; if this is done before, there is a tendency for the smoke from the flash to cause a belt over the picture. The above indicates some simple means of overcoming difficulties due to bad illumination, and may be noted by commercial photographers who often are expected to produce first-class results under very unfavourable conditions of lighting. Some may be inclined to adopt the usual reflector and diffuser in connection with the flash, but though this may at times be desirable when dealing with very irregular

lightings, we prefer to increase the flash in strength and keep further away from the subject if the building will admit.

* * *

Packing Negatives. Even in such simple matters as sending a negative through the post there are pitfalls for the unwary of which anyone to whom negatives come is being constantly reminded by the receipt of parcels of glass shattered to atoms by the thump of the post office stamp. Enlarging firms who would caution their customers ought to arrange for them to visit the sorting floors of a big postal depot. It would provide a salutary warning against packing negatives between pieces of card or with no greater protection than the cardboard plate box in which they travel at the risk of their lives. Now that so many pursue the photographic process no further than the making of the negative the safe transit of the developed plates to the enlarger is as important an item of after-treatment as intensification, yet many people seem not to know that to make perfectly sure of its safe arrival the negative should travel in a wooden box so that the walls keep the shock of the defacing stamp off it. If it be prevented from shaking about in the box by cotton wool, wood shavings, or even crumpled paper above and below, the sender may challenge the Nasmyths of St. Martin's-le-Grand to do their worst. One other little precaution should be noted. If several negatives of different sizes are being sent together they should be placed so as to prevent the smaller bearing unevenly on the larger. For example, a quarter-plate should not be sandwiched between two half-plates, but be laid upon them with a piece of card between.

* * *

Field-Camera and Cycle. Those photographers who reside in country districts and have occasionally to carry a heavy field camera and tripod upon a cycle realise that if care is not taken such means of transit are likely to have a very detrimental effect upon their apparatus. The best place for the camera case is without doubt upon a strong back carrier firmly secured to the machine, though some workers have a preference for the front carrier. In the latter position there is a greater tendency for the camera to be shaken about, while if a proper carrier is not used there is a certain strain upon the sides in guiding the machine, especially if the instrument is a heavy one. Even on a back carrier there is a tendency for the case to get badly rubbed, and even the instrument itself may be scratched if a little care is not taken as a preventive. Some time ago, after a cycle journey of some miles across badly made roads, we had the experience of a camera case rubbed right through by the vibration between it and the cycle carrier, together with a broken plate in the dark slide, which necessitated a further journey for the purpose of making another exposure. Since then we have prevented such trouble ever recurring, very simply, in the following manner. A couple of strips of felt about two inches in width and about an inch in thickness, such as may be bought for a few pence at any saddler's, is placed at the bottom of the camera case for the instrument itself and slides to rest upon, and another strip of felt is laid upon the carrier before the case is put on. The felt will absorb some vibration, and the troubles detailed above will not be encountered. We have also adopted this idea when travelling on a motor cycle, when it is equally successful. The best place for the tripod is across the handle bars or along the top tube of the cycle. Such a plan is far better than slinging the case upon the operator's back when, if the instrument is a heavy one, its weight is soon felt.

A QUESTION OF HYGIENE.

The recent epidemic which we have called influenza, because we know of no better name, has robbed the photographic profession of some of its best known members, while others, happily recovered, have suffered severely from it. As it is well known that the disease is most likely to attack those whose vitality has been impaired by any cause, it is worth while considering the conditions under which many photographers work.

Comparatively few photographic businesses are carried on in premises built for the purpose, and in contriving accommodation for the various branches of work there is often overcrowding and poor ventilation, both of which are inimical to health. It is, perhaps, in the dark-room that the worst conditions prevail, and now that bromide paper is so universally employed for printing, a much larger proportion of the working-day is spent therein than was the case when daylight printing was almost exclusively the practice. In excluding white light from an ordinary room there is always a great risk of excluding air as well, and, unfortunately, few dark-rooms are so contrived that when not actually in use they can be thrown open so that light and air are freely admitted. For it must not be forgotten that light has a purifying effect equal to, if not superior to, fresh air. In many cases the door forms the only source of ventilation, and, when closed, the unhappy operator has to breathe the same air over and over again. A good many years ago we were consulted with regard to a dark-room lamp which the purchaser declared was faulty, as, after being lighted for a few minutes, it commenced to smoke and gave practically no light. The dealer from whom it was purchased tested it in his shop and pronounced it to be in good order. This was also the case when we tried it. Finally, we ascertained that the dark-room was only about six feet square, and that it had a well-fitting door, so that "the light that failed" did so through lack of oxygen. If an electric bulb had been used instead of a paraffin lamp the question would not have arisen, but the operator's health would certainly have suffered. We have seen in a prosperous West-End business a dark-room which could only be used by opening the window for a few minutes after developing each set of plates. This allowed a change of air which was quickly used up by the two assistants working there, rendering another stoppage necessary. Here was a waste of time from a business point of view, besides incalculable damage to the health of the unfortunate inmates. It is not always realised that a gas or oil flame, which does much to vitiate the atmosphere of the dark-room, may, with a little ingenuity, be used to create a current for ventilating purposes. Even the electric bulb is of some value in this way, and the small half watts with their much greater heating power should be quite effective. Dampness in the dark-room is another fruitful source of ill-health, and we fear that this condition is often concurrent with bad ventilation, making a truly fatal combination. At least one instance of a robust man contracting tuberculosis through working in such a room has recently come under our notice.

We emphasise the necessity for a sanitary dark-room on account of the much greater proportion of time which is now spent in it. When daylight printing was used for the bulk of the work, perhaps two hours a day was the limit of time for which the operator was actually boxed up; but with bromide paper as the only medium, he is shut up practically the whole day. Although we have inferred that a printing-out process is more healthy for the worker than bromide in a badly ventilated room, it is quite possible to conduct it under adverse conditions, the use of the open arc for printing necessitating much more space and

better ventilation than is generally provided. We have in our mind one work-room where three huge pairs of carbons were being used for printing platinotypes giving off unsupportable fumes, while a large dry-mounting press still further poisoned the air. The girl employees looked like candidates for the hospital, and we were not surprised to learn that changes in the staff were frequent.

The war has taught us many things, especially with regard to labour, and nothing has been more clearly demonstrated than that true economy of labour consists in keeping the worker fit by providing healthy workrooms, working a moderate number of hours, and promoting cheerfulness generally. One bad practice which is common in most small businesses is for the workers to remain indoors during meal times. This should be discouraged, and except in bad weather a little outdoor exercise should be taken. If there is a lassitude and disinclination to do this it may generally be assumed that there is something which requires attention in the state of the premises.

The more sedentary the occupation the greater the necessity for outdoor recreation and exercise. "Health systems" are too dull for most people and are not likely to be persevered in, but walking, cycling, rowing, swimming, tennis, net-ball, and even football and hockey are all valuable medicines, not unpleasant to take, and the employer will do well for himself as well as for his staff if he practises one or other if possible, and encourages his staff to engage in such recreation.

THE BRITISH ACHIEVEMENT IN AEROPLANE CAMERAS.

The progress made during the war in the design and manufacture of cameras for photographing from aeroplanes has hitherto remained undisclosed except by the few and somewhat sensational brief statements which were published now and again in the lay Press, and which, it may be said, were usually wide of the mark. Messrs. Brock and Holst, in the paper which we reprinted in our issue of February 21 last, made certain sweeping claims to priority which in the following issue provoked denial on the part of two correspondents, both exceptionally well-informed as to what has actually been done in the production of cameras for the British air forces. Since the appearance of that paper we have had an opportunity of inspecting at the Kidbrooke camp of the Royal Air Force cameras representing the whole range of instruments which have been used during the war from the earliest days until its termination. The paper by Major Charles W. Gamble at the Optical Society on March 13 last has also set forth in very great detail the steps by which aeroplane photography has been raised to a great state of perfection. It is therefore well that some account be given of what has been accomplished and of the stages through which the aerial camera has passed.

At the outbreak of war photographs from aeroplanes or airships had been taken only in quite a casual and amateur way, and the military authorities were slow to recognise the great service which aerial photographs would render to the Intelligence Branch of the Army. Within a few months, however, the value of the aerial photographs received recognition, and cameras specially made for the purpose were first used early in 1915. The first or A model, long since abandoned, was of a quite primitive type, consisting of a wooden square-section cone-shaped body, carrying a lens of eight or ten inches focal length and fitted with a Mackenzie-Wishart adapter for envelopes taking 5 x 4 plates. The camera had to be held in the hand and pointed vertically or obliquely downwards by the observer as he stood up in the aeroplane. The Mackenzie-Wishart system allowed of a considerable supply of plates being taken up, but the relative fragility of the envelopes in the circumstances of their being handled by a wearer of thick gloves, coupled with a want of sufficient precision in bringing the plate accurately into the focal plane of an *f*/4.5 lens, caused this form of plate-holder to be abandoned.

Early in 1916 a modified pattern, the C model, of the first instrument was put in the hands of airmen. It differed chiefly from the previous model in the means adopted for holding and changing the plates. The camera was fitted with two magazines, one containing eighteen 5 x 4 plates, in metal sheaths, which was placed immediately over the focal plane, and the other (empty) magazine below it and to one side, the camera, of course, pointing downwards. By means of a horizontally moving metal plate, the lowermost of the plates awaiting exposure was pushed to one side and was received in the lower magazine, the operation of thus changing the plate also resetting the focal-plane shutter under cover of the moving metal plate. The principle of mechanically changing plates by discharging from a holder placed mouth downwards into one placed mouth upwards has been retained in later models in which the changing mechanism itself has been further improved.

The two foregoing cameras were both of wood, the disadvantage of which, as pointed out by Major Gamble in his paper, was the liability to expand or contract under the very wide range of temperature and climatic conditions to which the cameras are exposed. Inasmuch as a very slight alteration of the distance between an *f*/4.5 lens and the sensitive surface may disturb the definition, recourse was had to cameras of all-metal construction or to one consisting of wood framework, constructed so as to obviate expansion and covered with metal mounted thereon so as to cause no stresses in the structure in the event of its expansion. The E camera of the R.F.C. introduced in 1917 was an all-metal camera of this type, and was fitted with a changing mechanism similar to that of the C model, but with the difference that the plate was changed by pulling a cord, and, the occulting metal plate being thus dispensed with, the camera included a capping shutter to cover the aperture in the focal-plane blind during re-setting. A further new device first introduced in this model was an adjustable lens cone by which lenses of from 8 to 10½ inches focal length could be fitted and readily brought into use.

Up to this point all the cameras employing plates were operated, as regards changing the plate, entirely by hand, a system which had considerable disadvantages. Simple as an ordinary photographer would regard the operation of the changing mechanism, the fact that it had to be placed in the hands of men entirely unfamiliar with photographic apparatus called for a changing device which would be free from mishandling by the human operator. It need hardly be said that the airman has many other things to do besides taking photographs, and that he carries on his work always under the conditions of fire from enemy anti-aircraft batteries and of attack from enemy machines. Thus the next step, and one which brought the aeroplane plate camera almost to its most perfected form, was to provide a mechanical means of changing, operated by power other than that of the airman and brought automatically into operation immediately after an exposure had been made. This was done in the L camera first used by the R.F.C. early in 1917. With it the operator

had simply to use a Bowden release in order to make an exposure: the rest—resetting the shutter and changing the plate—was done mechanically and automatically. The ingenious device introduced for this purpose consisted of a small propeller mounted on the aeroplane and connected to the camera by a flexible shaft. This provided sufficient power for the operation of the plate-changing mechanism, the changing gear coming into operation on the observer releasing the Bowden lever.

An improved model of this camera came into use in 1918 as the LB and has proved the most successful of aerial instruments. It differs from the type just mentioned in being fitted with a self-capping focal-plane shutter which can be entirely removed and replaced by another in case of derangement. Moreover it can be adjusted as regards slit-width by an external lever, and there is the further provision of operating the plate-changing by hand or power as necessary and of instantaneously altering it for use by one or the other means. A further improvement was the series of most rigidly made and finished lens cones, enabling lenses of 4, 6, 8, 10, and 20 inches focal length being used on the one camera.

The principle of a propeller drive for the mechanical changing of plates was also applied to a camera of much larger size, for 18 x 24 cm. plates, first used by the R.A.F. in 1918. The camera, which perhaps may be said not to have been quite fully perfected at the time of the Armistice, is fitted with lens cones allowing the use of objectives of from 7 to 20 inches focal length.

Other cameras of simpler type have been used both in the Royal Flying Corps and the Royal Naval Air Service for purposes more or less special to the requirements of these services. Certain of these are cameras fitted with a stout handle or grip by which the instrument can be held and pointed obliquely in order to produce a type of photograph distinct from that obtained with a vertical direction of the lens axis. Thus in preparing for operations with tanks in France, photographs taken obliquely are necessary in order to yield an idea of the nature of the ground over which the attack is to be delivered; and similar oblique pictures are taken for many purposes of the Admiralty, for example, in order to obtain records of the correctness with which the masters of ships proceeding as a convoy are carrying out their instructions as to formation.

But perhaps the camera evolved for aeroplane work which would provoke the greatest admiration of a connoisseur in mechanical devices is that known as the F, and first used by the Royal Flying Corps in 1916, after having passed through its trials at Farnborough during 1915. This is a camera taking a continuous series of 5 x 4 pictures on a roll of film sufficient for 120 exposures. The mechanism is operated by a propeller so that as the aeroplane travels the photographs are automatically taken at intervals corresponding with a certain number of revolutions of the propeller. Simultaneously with the exposure of each section of film a tiny record is made on each (by means of a small supplementary lens) of the reading of the height of the machine and of its compass bearings so that each negative is provided with a record of the direction of flight over the territory which is being photographed.

PRACTICUS IN THE STUDIO.

[Previous articles of this series, in which the aim of the writer is to communicate items of a long experience in studio portraiture, have appeared weekly since the beginning of the present year. It is not thought possible to continue the series to the length of that by the same writer which ran through the "British Journal" some years ago, but if any reader among the younger generation of photographers, and particularly those engaged as assistants, has a particular subject which might be dealt with, his or her suggestion will be welcomed. The subjects of the previous articles of the series have been as follows:—

A Talk About Lighting (Jan. 3).
The Camera and the Lens (Jan. 10).
Managing the Sitter (Jan. 24).
Backgrounds (Jan. 24).
Studio Exposures (Jan. 31).
Artificial Lighting (Feb. 7).
Printing Processes for Portraiture (Feb. 14).
Studio Accessories and Furniture (Feb. 21).
The Surroundings of the Studio (Feb. 28).
Studio Heating and Ventilation (March 7).
The Postcard Studio (March 14).

THE PRINTING-ROOM.

No matter how small a business may be the arrangements for printing should receive the most careful attention, and makeshifts only employed when absolutely unavoidable. In a one-man concern every device which will save time should be adopted, as the photographer's time is naturally of more value than that of a junior assistant. Moreover, proper rest is necessary to efficient working, so that even if an energetic man is willing to put in a sixteen-hour day he should refrain from doing so unless he wishes to bring on a premature collapse. I mention this because I recall the case of an unhappy man who opened his studio at 10.30 a.m., interviewed sitters and made negatives till 9 p.m. and did his printing and mounting outside those hours, his arrangement being so primitive that while negative work was in hand nothing else could be done.

If it be possible, a separate room, or at least a portion of the dark room, if large enough, should be fitted up for printing exclusively, so that it can be carried on without interfering with other operations.

Adequate sink space is the key to easy work. I am rather a crank on this subject and would almost go as far as to put in sinks wherever there was room. As I have said many times it is easy to turn a sink into a bench by covering it over when not needed, and while the plumber is at work the extra cost is not great. Most dark rooms are inadequately supplied with washing accommodation, and this is one of the greatest errors which can be made. Lead-lined sinks are generally recommended and for negative work leave nothing to be desired, but for printing I favour stoneware sinks, which can be used as washers for small and large sizes alike. Where large quantities are handled they are excellent for development as they save the cost of large dishes and avoid the risk of breakages.

As bromide and gaslight papers are used for the greater part of the prints now issued I will give details of a printing-room which I fitted up and from which large quantities of prints are being turned out. The room is about fifteen feet square and is fitted with benches along two sides and a row of Doulton stoneware sinks along a third. The entrance is on the fourth side, and this is so trapped that free entrance and exit can be obtained while work is in progress. On one bench are placed the negatives to be printed with the order forms, while below are drawers for storing sensitive papers. On the next bench are the printing-boxes, three being

strip printers capable of taking any size up to half-plate, while two others accommodate negatives up to whole-plate and 20 x 16 respectively. Trays for unexposed and exposed paper are placed between the machines, and those containing the prints can be carried to the developing trays without unnecessary handling. Four large stoneware sinks are ranged close together for developing, fixing, and washing. In the first stands a porcelain dish containing amidol or M.-Q. developer; the second is filled with acid hypo, while the third and fourth serve for washing, water running into them the whole time. The prints are transferred from the hypo to the first sink, and after about ten minutes to the second, where the washing is completed. With this arrangement several thousands of prints in assorted sizes are easily made daily. This scheme may be carried out on any desired scale, a single printing-box and a couple of sinks being sufficient in the majority of cases. The point to be aimed at is the arrangement of apparatus so that it is always ready for use.

There are many good printing-boxes on the market, and it is better and probably cheaper to purchase one of these than to make one, although this can easily be done by anybody with a knack for carpentry. These should have a ground-glass diffuser and a vignetting arrangement. For this latter I prefer a sheet of clear glass on which vignette forms can be laid; it is then easy to modify the shape of an opening by putting another on top, or at one side, or by adding a torn piece of card. Vignetters and loose pieces can be kept in position by laying small weights upon them. For general use the printing-box should take negatives up to whole-plate, as a larger size means unnecessary labour in handling. If many large negatives have to be printed a 12 x 10 box and a strip-printing box to take up to half-plate will be found convenient. The illuminant will usually be electric glow lamps, from one to half-a-dozen being required according to the rapidity of the paper used. With such papers as Velox, Kodura, and Cyko, a short exposure to a strong light will give better results than longer exposure to a weak one, especially when vigorous negatives are being printed.

Where no current is available incandescent gas will be found a good substitute, but, of course, in this case the burner must be at the side of the box and the light received upon a silvered or enamelled mirror at the usual angle of forty-five degrees. Failing gas a good duplex or circular wick lamp may be used, care being taken to keep the burner very clean and to use only good quality kerosine oil. Acetylene is an excellent printing light, but should only be used in a very large and well-ventilated room. Used in close quarters it causes headache and nausea in many people. Whatever form of printing box be used it is desirable that the negative should be illuminated by red or yellow light, between the exposures, as this greatly facilitates the placing of the paper upon the negative. With electric light this is usually done by fitting a two-way switch and placing an extra, red and yellow, bulb beside the white ones inside the box. With gas or oil a yellow glass exposing shutter must be fitted, and this may conveniently be operated by a treadle. Boxes fitted with a single bulb only may be improved by fitting four pieces of ordinary looking-glass so as to make an inverted hollow pyramid; when correctly adjusted there should appear to be five lamps when the interior is viewed through the negative opening. When working with thin negatives it is easy to reduce the light to any extent by interposing thicknesses of white paper, the best position for this being on the surface of the ground glass diffuser. It is very desirable that the top of the printing box should be so fitted that a large sheet of paper can be used if needed, not only for white margin work but for multiple exposures upon one sheet. A very handy way of working is to make six cabinet exposures upon a 15 x 12 sheet. This is done by exposing three along one edge and then turning the sheet and exposing along the other edge. Not only does this tend to uniformity of colour and depth but it saves time in handling and automatically sorts out the orders.

Some system of exposure test should always be available so as to ensure the best results from a difficult negative or when taking up a new brand of paper. Obviously the ordinary strip method cannot be applied to most printing boxes, but it is quite easy to make an actinometer plate by exposing an ordinary negative plate in strips to a weak light and developing fully out. This can be placed under the negative and a long exposure given; it is then easy to calculate the exposure required. A useful range is to make the scale so that the thickest end admits one-thirty-second of the light which passes the clear end.

For large work printing frames are necessary unless a printing box of exceptional rigidity of construction is available, and even then my preference is for frames of the box form. Most bromide paper is now on a fairly stout base and much more pressure is necessary for this than for the older printing papers. In exposing large prints it is desirable to work at a considerable distance from the light to secure evenness of illumination; twice the longest side of the plate is a safe distance.

The fixing bath should be of goodly dimensions, with regard to the work to be done, and it should be replenished from time to time with fresh solution. It is a great mistake to allow the bulk of the bath to decrease much, as not only is the solution already weaker, but there is not sufficient for the prints to be moved about freely. Practically no amount of immersion without movement will safely fix a number of prints. I have tested some which have been massed together in the hypo for over an hour and found unaltered emulsion.

The washing after printing is of the greatest importance and does not usually receive the attention it requires. There is no better way for large or small quantities than hand washing from one sink or dish to another. If a range of three sinks with overflow plugs can be arranged the prints can be placed in the first direct from the hypo, the water running the while. When a good number has accumulated they are transferred singly to the second sink and so on to the third. If no assistant be available the printer should stop at, say, each gross of prints to make this change, or he may leave all in the first sink until he has finished his batch. But this plan is not to be recommended, as it leaves too many prints to be handled properly.

Platinotype printing is so simple that it requires little special arrangement, the only special appliance needed being a gas ring for heating the bath for sepia work. For exposing, a mercury vapour or arc lamp may be used in poor light; the arc if used direct is rather apt to give flat prints, so that it is preferable to use a pattern such as Marion's Northlight printing lamp, which gives a powerful reflected light. If this lamp be used it should be placed in a fairly large well-ventilated room.

For carbon printing a slightly different arrangement is necessary; the work-room should be fitted with a large deep sink with boards to confine the unavoidable splashings. The developing tank should be warmed by a gas ring below, or, failing this, have a constant stream of warm water running into it. I have found nothing better for this than one of Fletcher's open pattern heaters as fitted over lavatory basins. These supply an ample supply of hot water, and as the heat can be regulated they can be used by the addition of a smaller rubber tube as a "squirt" for local development. I have found plate glass the best covering for the mounting bench. Ample space should be allowed for carbon work so that no splashes from the alum bath are likely to reach the mounting board or developing tank.

PRACTICUS.

THE PHOTOGRAPHERS' ASSISTANT.

The masters plead inefficiency as excuse for low wages, and bewail the lack of good assistants.

The assistant pleads lack of means and absence of encouragement as excuse for inefficiency. Which is right?

The position of the average assistant in the average photographic business has been in the past anything but an enviable one from any point of view. He is expected to handle successfully a large range of materials which are sensitive to many influences, often in circumstances and with apparatus that are in themselves handicaps to the production of good work. The knowledge and skill required to cope with the never ceasing stream of technical problems are perhaps greater than in any other craft, not only because of the existence of those problems, but also because the photographic business is not so sharply sub-divided into its many branches, and an assistant may be called upon at any time to do work of a kind quite outside his ordinary job, and is expected to produce results equal to those of a man whose regular practice it is.

That roughly suggests what is expected of the assistant as regards his work. Usually he is required also to keep an appearance above that of a wage-earner, such as a mill-hand, letterpress printer, or bricklayer, and to cultivate the affability of speech and manner which is perhaps the principal asset of the successful doctor or lawyer. The dark-rooms in which many assistants spend nearly a third of their lives and most of the hours of daylight often are little better as regards health or comfort than the workrooms of many years ago described so vividly by Charles Kingsley in "Alton Locke."

So that compared with other crafts, quite apart from the rate of wage, photography exacts more, and offers less. That the average rate of pay, and consequently the social position, of the photographer's assistant, is comparatively very low is a fact, obvious and admitted. What are the natural consequences of this?

I think that assistants may be divided broadly into two classes. The first class has caught the fascination which undoubtedly exists in photography for anyone with average intelligence and a little imagination. If to these qualities the assistant adds ambition he usually becomes the master-man eventually, but the business knowledge essential to success is not easily gained during the assistant period. The second class, by far the larger one, and probably still more increased by war recruits to the business, comprises those who are by nature slack, unintelligent, or unambitious, and those for whom the handicaps and discouragements incidental to the struggle for success in such an exacting calling have proved too great.

The worker who has struggled to efficiency in spite of the many difficulties in his path still finds that adequate reward is not easy to get. He may have worked for a low wage for the chance of getting special experience, but the last rate of pay earned is still too often taken as the measure of a man's value. Many employers, far too many, are imbued with the idea that if they only advertise and sack, advertise and sack, often enough they will eventually secure for the inefficient's wage either one of the skilled men willing to work for little money to increase his experience, or one of the disappointed ones for still less. The result is that the latter either recover a bit of their ambition or sink entirely to the level of the man who only does just enough, and that hardly well enough, to earn his salt. The ambitious man very quickly picks up what he wants to learn and moves on, so that this type of employer is seldom suited for long. Another type of employer has greatly increased of late years in the shape of the "company shops," who turn out large quantities of inferior work by semi-skilled workpeople on the "factory" principle. The wages offered by these firms to inefficients are often much higher than those paid by firms of standing to expert assistants.

I have tried to show that the conditions fostered by employers tend to discourage a man from becoming efficient, besides offering him little reward if he overcomes the difficulties, often needless and stupid, placed in the way of his improving his ability. That there is "plenty of room at the top" is not true of photography, for there are always vacancies for those willing to accept a low wage; but a man who has made a study of his business and knows his real ability is often turned down in favour of one who will work for a little less money. It does not seem to occur to the average employer that the careful and conscientious worker can easily save the extra pay he asks, both in time and material as well as in quality of output. Yet we find the employers continually bewailing the difficulty of finding efficient assistants!

Make the life of a really good assistant worth living, by giving him tools and material that will be a pleasure to work with, in clean and healthy workrooms, and pay him a wage that will permit him to have a decent home that he can take a pride in, as well as to have a hobby or two and the time to enjoy them in, and there will very soon be an army of assistants making themselves efficient. A few employers have realised this, and find it pays them well to pay their staff well.

Among those about to return from the Army employers will be looking for experienced assistants. Let me tell employers of a spirit that they may expect to find in these men, which I have noticed spreading among all ranks during the past year or more. It is a spirit of antagonism to injustice, and is perhaps a sort of reaction against the harsh "militarism" and so-called "discipline" of the Army. It is not rebellious or antagonistic to authority, but men have been taken out of their ruts, and have been living a life summarised by "look after yourself, for no one else will." Living hugger-mugger with men of all classes, Jack finds out that he's as good as his master, and often better. This has resulted in a spirit of camaraderie flavoured with independence, which shows itself outwardly among the men by willing work so long as those in authority do not "come it," and by obvious resentment and often by obstructionist methods if they do. Per contra, officers and N.C.O.s find it pay better to recognise this new spirit, which has replaced the old "shirk while he isn't looking" idea, and there is increased mutual confidence and respect. Men are told, as recruits, that the Army can tame even lions, but it has gone further, and is taming even sergeant-majors.

This new feeling of self-reliance and impatience with injustice, if it can show itself so strongly in the most autocratic institution we have, is not likely to be shed when the khaki is left behind.

D. Charles.

The Shops Act.—A reply to a correspondent last week has, it appears, given rise to a wrong impression in the minds of several readers. Our correspondent made certain inquiries to which we replied specifically, but it must not therefore be assumed that there has so far been any relaxation of the Early Closing Order, according to which the great majority of retail businesses compulsorily close at 8 o'clock.

The City Sale and Exchange informs us that its four chief branches, namely, those in Aldersgate Street, Lime Street, Fleet Street, and King's Road, Chelsea, each publishes a list of second-hand apparatus, each representing a different stock of goods. The list sent to us with this intimation—that from the Aldersgate branch—specifies a very great variety of lenses and of cameras of all descriptions.

Houghtons' Show at Leeds.—Messrs. Houghtons, Ltd., are arranging an exhibition of apparatus and other specialties of theirs for the professional photographer at the Grand Central Hotel, Briggate, Leeds, from March 24 to 29, both dates inclusive. The exhibition will be attended by Mr. Ibbs, manager of the firm's professional department in London, and Mr. Richards, the Northern representative. Among apparatus which will be shown is the Ensign de luxe printing cabinet (a notice of which is held over), the Pawl bromide strip-printing machine, and the Ensign rotary bevelling machine. Other exhibits include the Ensign dry-mounting tissue, postcards, papers, etc., of which samples will be obtainable on presentation of trade card. There is no doubt that photographers in the North will take this opportunity of seeing the many well-designed and manufactured specialties for their use, for which Messrs. Houghtons have long enjoyed a high reputation.

THE AIR RAIDS ON LONDON.

Damage Done to Photographic and Allied Premises.

During the period of the war the Censorship has been so strict that no details could possibly be published as to where the bombs had dropped, and what damage had been done to the trade, in the twenty-five air raids, Zeppelin and aeroplane, which took place over London from May 31, 1915, to Whit Sunday, May 19, 1918. The veil of secrecy has now been lifted, and it is permitted to publish the official details which have been issued by Lieut.-Commander Sladen, R.N., who was then the chief of the London Fire Brigade, but has now retired on a pension of £720 a year; and these that follow have to do with damage done to photographic and allied premises. The first damage to trade premises was in raid No. 1, which took place on Wednesday, September 8, at 10.45 p.m., when 336 sets of premises were damaged; 23 incendiary and 21 explosive bombs were dropped, 5 people were killed, and 33 injured. By an explosive bomb which dropped, Messrs. W. Hayward and Sons, Ltd., of 65, Farringdon Road, E.C., photograph frame-makers, had their building and the contents damaged by breakage. In raid No. 4, which occurred on Wednesday, October 13, 1915, at 9.27 p.m., the premises of "The British Journal of Photography" suffered as the result of an explosive bomb, the building and the contents being damaged by explosion and dirt. Close by a bomb fell, which damaged the Lyceum Theatre, killed 19 males and females, injured 12 seriously, and slightly injured 9 others. As the result of an explosive bomb which fell at 100, Finsbury Pavement, E.C., the London Portrait Company, Ltd., had their building and contents damaged by explosion. In raid No. 9, which occurred at 11.36 a.m. on June 13, 1917, damage was done at 77-79, East Road, Shoreditch, to the premises of the London Manufacturing Company, photo frame-makers, the window glass being damaged by breakage. Messrs. G. Johnson Brothers, of 43, Beech Street, City, metal photo frame-makers, also had their window glass damaged by an explosive bomb. In raid No. 10, which occurred at 10.36 a.m. on Saturday, July 7, 1917, when between twenty and thirty huge Gothas flew over the City and Central London in broad daylight and leisurely dropped sixty-six bombs in the busiest districts, of which, fortunately, seven failed to explode, enormous damage was caused to City warehouses, particularly in St. Bartholomew Close, Little Britain, St. Martin's-le-Grand (where the General Post Office was badly damaged and the military sentry killed), Aldersgate Street, Golden Lane (Finsbury), Bread Street (Cheapside), St. Pancras, Stoke Newington, Shoreditch, Bermondsey, Holloway, Peckham, Limehouse, Holborn, Old Street (City), Haggerston, Bow, Southwark, and Hoxton. In all, 903 sets of premises were affected, 41 persons were killed, and 87 injured. In this raid there was damage caused to a big block of buildings in Chiswell Street by an explosive bomb. Mr. C. A. Rudowsky, of 89, Chiswell Street, E.C., had his premises severely damaged by explosion, and himself had an almost miraculous escape, and the City Frame Company, Ltd., of 34, Coleman Street, E.C., photo frame manufacturers, had their window glass damaged by breakage.

In raid No. 11, which occurred at 11.50 p.m. on Tuesday, September 5, 1917, Mr. L. Bure, of 14, Castle Street East, W., photograph frame importer, had his window glass damaged by breakage. By an explosive bomb which fell in John Street, Adelphi, W.C., the Camera Club, at 17, John Street, had their premises damaged, the chimney-stack, roof, and window glass being damaged by breakage. Messrs. F. W. Woolworth and Co., Ltd., of 178-80, Edgware Road, W.2, photo frame dealers, also suffered as the result of an explosive bomb, the window glass being damaged by breakage. In raid No. 12, which occurred on Monday, September 24, 1917, at 8.8 p.m., Messrs. W. G. Parker and Co., of 100, Russell Square Mansions, suffered as the result of an explosive bomb, the window glass being damaged by explosion. The effects of this bomb were most disastrous, as in these mansions ten males and one female were killed, fourteen males and ten females injured, and two males afterwards died. The Award Film Service, of 5, Edward Street, Soho, W., suffered, also as the result of an explosive bomb, a building of four floors, about 50 ft. by 20 ft., being damaged by the explosion and breakage, and the window glass by breakage. Messrs. F. R. Batt and Co., Ltd., 10-11, Wardour Mews, Soho, W., had their window glass damaged by breakage. They are X-ray apparatus makers. In raid No. 13, which occurred at 7.53 p.m. on Tuesday, September 25, 1917, Messrs. Haigh and Co., of 240, Old Kent Road, S.E., photo frame manufacturers, had the window glass damaged by breakage, as did Mr. C. E. Boxall, photographer, of 246, Old Kent Road, S.E., both as the result of the same explosive bomb. No further damage was done in any raid to trade premises until the last of the series, which occurred on Whit Sunday, May 19, 1918, when no fewer than 300 sets of premises were affected by the twenty-nine explosive bombs which the Huns dropped, killing 34 people and injuring 94 others. By an explosive bomb which dropped in Bolsover Street, Upper Marylebone Street, W.C., wrecking St. Clements' House, Ltd., which was used as a ladies' club, the window glass was wrecked of 196, Bolsover Street, tenanted by Messrs. Watson and Son, X-ray apparatus manufacturers. This was the only damage caused, and concluded the Hun method of warfare on defenceless women, children, and men by means of bombs from Zeppelins and aeroplanes, much to everybody's relief.

AN OUTSIDE VIEW OF THE SOLICITATION SYSTEM.

[Portrait photographers who live by the invitation system will no doubt thank us for reproducing part of an article in the current issue of "The Advertiser's Weekly," entitled "The Lines that Hook the Order." It will here be seen with what pertinacity those who offer to take portraits for nothing bombard possible members of the public with letters, statements in some of which must surely impress the recipient as having a very slender relation to facts. When it is possible for a professional writer on advertising to collect such specimens as these, it is time for photographers to cease shouting from the housetops that they are professional men. Not even the grocer and the fishmonger are such servile beggars for custom.—Eds. "B.J."]

For keen competition in business commend me to the fashionable photographers. Their methods of securing sitters are most persuasive, and must account to a large extent for the generous supply of pictures of society beauties and others appearing in the illustrated weeklies and the daily newspapers.

It would take pages of "The Advertiser's Weekly" fully to criticise the methods of the dozen or so high-class photographers who wrote in for "the honour of a sitting." I will take a few whose letters vary in style. A certain well-known Bond Street firm sent a nicely expressed, well-typed letter with the personal touch, saying, "We should be extremely obliged if you could give us a complimentary sitting. . . . We are desirous of taking this for publication in the illustrated society and weekly papers, and shall be glad if you will accept a set of portraits passed by you for publication. If the sitting, which we hope you will be good enough to grant us, can be exclusive to ourselves for this particular purpose, we shall be pleased to present you with one of our pencil sketches . . . in addition to the copies . . . We have been asked by the editors of several papers to let them have these photographs as soon as possible." It is a nice bait, but I am inclined to add the word "query" after the last sentence. In striking contrast, the next application, from a "Court photographer," came a Roneo letter with date, the name of the recipient, and the event filled in in handwriting. The opening ran: "The Press are desirous of securing copies of your portrait for publication in the leading illustrated periodicals . . . there will be no charge made whatsoever, and you will be under no obligation to purchase"—but no offer of a free photo. Another unambitious effort by a Royal warrant-holder was a letter similar to the former, which began: "I have been asked by the press (small p) to secure copies of your portrait for publication in the leading illustrated papers. . . . The expenses of the sitting are entirely my own, and you would be under no obligation whatever."

A really appealing letter, typed neatly on good stationery, likely to make a good impression, reads:—

"We shall greatly esteem the honour if you will permit us the favour of a special sitting for the purpose of making an up-to-date camera study for the illustrated papers. . . . Finished proofs will be sent to you, and we shall esteem it a courtesy for you to retain two of these finished photographs as a souvenir of your visit, free of charge. We enclose an appointment card; on receipt of same from you a studio and dressing-room will be reserved."

An excellent specimen of effective letter-writing.

Several other firms wrote asking to be "favoured" or "honoured" or would the recipient "be good enough," etc., as "the best society journals are asking for your portrait." As an inducement, one well-known studio made the indefinite offer: "We shall also have much pleasure in asking your acceptance of approved positions finished in a permanent process"; another was kindly disposed to give "a complimentary copy," and a third "a finished copy of the two proofs you like best."

The gem of the budget of letters received came from a photo-artist whose work figured daily in the public prints, and who shows by his correspondence a keen knowledge of human nature and how "to hook the fish." His stationery is in the best of good taste, his letters are neatly typewritten, and his follow-up system effective, combining an excellent canvass by correspondence. As a contrast to others in the business, a few extracts will prove the pulling power of this fashionable letter-writer, who wrote:—

"May I bring before your notice that I have my own private Press agency in the City for the circulation of photographs and information to the papers both at home and abroad, and I am in an exceptional position for supplying society papers with portraits of ladies or gentlemen. . . . If it meets with your approval, I should be most happy to take your portrait in order that I may have a picture to use for the above purpose; and as I should very much like you to have some finished copies to show your relatives and friends, I will send for your acceptance, free of any charge or obligation, one finished picture from any three proofs you select."

Getting no reply within a few days, this energetic gentleman follows up with a letter marked "Urgent," in which he says:—

"I beg to remind you that some of the society papers are calling upon my Press agency for a portrait of you. I should therefore be very grateful if you can now see your way to acceding to my several invitations."

He had only given one. The letter finished with the old tag in new wording about the presentation picture. Failing to draw the sitter, another follow-up was received, which ought to induce any bride-to-be to patronise a gentleman so interested in her affairs. As a model of excellence in follow-up correspondence, I reproduce it in full:—

"In writing to you again, I beg to say that I have no desire to importune you, but am only afraid my previous letters have either gone astray or have been overlooked by you owing to pressure of circumstances. As I am aware that you must be very busy and may not have time for a sitting, would it be pleasing to you to loan me a good photograph (one which was taken to your own order and not in answer to an invitation from any photographer)? This I would duplicate and circulate through my private Press agency without any charge or worry to you in any way whatever. Needless to say, if you have time I would prefer a sitting, though in either case would you let me have a few lines of information suitable for reproduction with the picture?"

The illustrations given of how to and how not to conduct advertising by post show that there are to-day many firms of good standing who have yet a great deal to learn in the art of letter-writing.

FORTHCOMING EXHIBITIONS.

April 17 to May 22.—Hammersmith Hampshire House Photographic Society Annual Exhibition. Two open classes. Joint secretaries, J. G. Abrahams, 41, Hamilton Terrace, London, N.W.8; A. H. Page, 12, Lime Grove, London, W.12.

Export Free List.—It is announced by the Board of Trade that from March 15 last a large number of goods have been removed from the list of articles exportable only under licence or guarantee, and may now be freely exported to all non-enemy destinations and to those enemy destinations with which trading is now permitted. Among these goods are:—

Photographic goods, but not chemicals therefor
Sensitised paper and plates.
Cinematograph films, raw or printed.

In reference to the prohibition of chemicals for photographic goods, it requires to be noted that metol is included among the "drugs" which may be exported.

Assistants' Notes.

Notes by assistants suitable for this column will be considered and paid for on the first of the month following publication.

Specialization and Efficiency.

The advice to specialise in one or perhaps two particular branches of work is frequently given to the photographer whether he be a master, assistant, or amateur. This advice is often rather vague, first as to the "why" and more so as to the "how" of the question.

I am writing more particularly for the benefit of the assistant, because one who has a business of his own has usually found out what particular lines pay him best, and how to push the sale of them. Still, it is strange to notice the great number of photographers' note headings stating this, that, or the other to be a specialty (or "speciality," or "specialité"), but which can form only a very tiny portion of the business done. For instance, an order comes to quite a small studio for an oil-painting. The photographer puts the work out, takes the profit, and feels pleased with himself at having launched out into a high-class and profitable branch, so has all his stationery imprinted for ever after "Oil-paintings a specialty," in the probably vain hope of a succession of such orders. Another advertises "Wedding-groups" or "Child-portraits" as his specialty, not necessarily because weddings are frequent in the one man's neighbourhood, or that the second is extraordinarily successful with children. If any definite reason for printing these phrases on note-paper can be given, it usually is only that "it sounds well."

Another sort of specialisation was criticised in a letter recently by an "All-round Hand" on behalf of his class. He described a retoucher whose work was so "effective" that the portrait looked very nice but not a bit like the subject, and a receptionist whose "specialising" in her own department was so water-tight that she failed to recognise what was wrong with the portrait when complained of.

I do not call these things specialisation at all. I don't know what to call them. We have specialists in the Army. In the infantry a soldier may be, for example, a Lewis-gunner, a sniper, or a mess-waiter, *but he must be a good infantryman first.* I think the same applies to a craftsman, such as a journeyman photographer.

When an assistant has had a few years' practice and can, say, correctly expose on a well-arranged group, develop plates evenly, make good bromide prints that will tone well, and make a fair show at one or two other departments he will realise that some jobs are better paid than others. That will be the first reason "why" he should specialise. Then he will find that one branch of work appeals more than others, not necessarily because it seems more lucrative or easier, nor because it is a clean-hand job, but because it is more interesting. In short, he likes that particular work. If he does not like one branch better than another the assistant should go further afield for wider experience till he does find work he can like. One spends nearly all one's life in work, so why not expend a little effort in finding something to do that one can enjoy doing? That is the second "why" for specialisation. After a bit one finds that one is able to do certain work better, and with less effort, than other kinds. Again, this is not necessarily because it is easy work, but one "picks it up" more easily, and one feels more sure of one's self in doing it. In ninety-nine cases out of a hundred the kind of work that a man finds he can do best is the same as the kind that he likes best. It's quite natural when you come to think about it, and it works both ways. Anyone likes doing what he can do well, and in doing it with interest is likely in time to do it as well as it can be done. When that stage is reached, surely he is in a position to demand a higher price for his work.

That is the right sort of specialisation. It does not prevent a man being skilful in other branches. Rarely is it possible for a worker to reach the highest grade of ability in any branch of photography without at least a working knowledge of other branches. Retouching is probably the line in which the worker usually knows least of other departments. The aim of so many retouchers is to produce a beautifully modelled "effect," and to make a face resemble one of those nicely rounded plaster casts that they practised

light and shade from at art school. They like to call forth the remark "How nicely retouched," forgetting that the greatest art is to conceal art, and that the best retouching is recognised by its apparent absence. A retoucher should know how his (or more often her) work will print, not only in a P.O.P. proof, but in other processes and surfaces, and be able to modify it accordingly. No one can be considered efficient unless the effect of his work on subsequent stages is understood and intelligently handled.

And that brings me to the question of efficiency. When an assistant decides to specialise, obviously he must reach a certain stage of efficiency before he can claim to be a specialist. There is an absolute test by which he can know when he has reached that stage. His employer or manager will be in the habit of giving the assistant instructions as to what is required, and how to set about it. The assistant should aim to be able, in at least one branch of work, to look his chief in the eye and say "Leave that to *me*." That is the test of efficiency.

Now for how to set about it. Assistants in photography are at a very great disadvantage, usually as regards so-called experiments and other essentials to improving their work. I have never yet met an employer who offered an assistant the use of his studio on an "off" afternoon to try his hand at posing and lighting, nor one whom one felt like asking for that favour, still less one who would supply a few plates and some developer for practical tests. Therefore, unless one assists in the studio itself it is not easy to get even a starting knowledge of this work except in at home portraiture. All the same, within limits this is a very good school, for when the student can make a good portrait in an ordinary room or garden he won't have much difficulty in doing better studio work. A pair of "smoked" spectacles are useful to see the light and shade effect by eliminating much of the colour in the subject, and much practice may be got without using plates.

Of course, books are necessary. A pile of old "B.J.'s" and Almanacs provides a host of useful knowledge. The great thing, though, is to learn to work systematically and to cultivate the power of observation, for in photography it is often apparently small things that make big differences. A splendid idea of what I mean by system can be got from the "Watkin's Manual," which will soon teach the student what he wants to know about exposure and development.

In printing it is a good idea to take one good negative, one flat one, and another on the contrasty side, and practice on these only till one can produce the best possible prints with ease and certainty. With a standard developer, at normal temperature, try various lengths of exposure and varying length of development. When the different sort of results obtained have been carefully observed, the next thing is to start over again with a weaker light, or at a greater distance from the light, which amounts to the same thing, and compare the results with the first lot, noting where improvement has been effected and where not. I am referring to bromide printing. It is not necessary to spend a lot, even at war prices. Half-plate paper cut into four is quite large enough for practice work, but the great thing is to take time to observe closely the differences between different prints, and to aid this it is essential to mark on the back of each strip the exposure and length of development, and other variable factors.

It is only by starting slowly and systematically on the lines suggested that a really good "grounding" can be obtained in any subject, and it is only with good grounding that one can rapidly become efficient when the elementary stage has been passed. Attempts to short-circuit the process by practising only on the more advanced stages leads to mediocrity. It is that half baked sort of ability that has brought the term "all-round hand" into such disrepute. Every assistant should be an all-round hand, with one or two special abilities. A man of that kind is ready to tackle any sort of job that comes along, whether it comes within his previous experience or not.

Assistants who reach that stage of ability have nothing to fear from the snap-shotter who thinks how nice it must be to be working continually at such an interesting hobby, and whose enthusiasm gives him or her enough ability to get a start (and a disillusionment) at a few shillings a week. It is enthusiasm that is needed to get on, and no one can enthuse over poor work. Any assistant who feels that the class of work he is employed in is not worth doing well is hereby advised to do it as well as he can all the same, whether the pay makes it worth while or not, and whether that particular employer appreciates the effort or not. It is always practice that makes perfect, if the practice has an object and some system behind it; and when such efforts have had the desired effect by improving ability, then is the time to get a better job. —D. Charles.

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Applications, March 3 to 8:—

Cameras.—No. 5232. Cameras. E. L. Walker.

Bas-Reliefs.—No. 5486. Means of obtaining photographic bas-relief and dies. A. J. E. Hill.

Photo-Copying.—No. 5406. Photo-copying machines. W. B. Dawkins.

Projection Apparatus.—No. 5357. Means for operating, delivering, and displaying optical, etc., projections. J. Davis.

Cinematography.—Nos. 5350 and 5353. Cinematograph projectors. T. Royle and W. Whitehead.

Cinematograph Projection.—No. 5233. Projecting cinematograph pictures. E. L. Walker.

Cinematography.—No. 5306. Cinematographs. R. S. McConnell.

Cinematography.—No. 5823. Cinematograph apparatus. W. T. Adamson.

COMPLETE SPECIFICATIONS ACCEPTED.

These specifications are obtainable, price 6d. each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

Metallic Lantern Screens.—No. 104,883 (March 17, 1916). The support is coated with a metallising substance in the form of a paste comprised of a suitable metal in the form of powder, to which is added brown varnish, siccatif, and turpentine, the paste thus obtained being applied with a brush and then rolled. As a "matting" coating a solution of white gum and zinc white is used

An example of the metallising substance is as follows:—

Powdered aluminium or other metal	100 grams.
Brown varnish	200 c.c.s.
Siccatif	300 c.c.s.
Turpentine	300 c.c.s.

The paste obtained is applied with a brush and immediately rolled.

In the "matting" substance the proportion of zinc white varies according to the dulling effect required. As an example, to each litre of water 25 grams of white gum and 5 to 25 grams of zinc white are added.

The solution thus obtained is applied with a brush in one or more coatings: the coatings are transparent, supple, and milky, and the screen can be rolled without inconvenience. Joseph Chanteux, 63, rue Traversière, Brussels, Belgium.

Trade Names and Marks.

APPLICATIONS FOR REGISTRATION.

Monophen.—No. 380,787. Photographic developers (chemical). White Band Manufacturing Co., Ltd., 121, Selsdon Road, South Croydon, Surrey; manufacturing chemists. November 27, 1917.

MARKS PLACED ON THE REGISTER.

The following marks have been placed on the register:—

V. B. D. Plex (Design).—No. 380,095. Photographic prints. Vincent, Brooks, Day and Son, Ltd., 48, Parker Street, Kingsway, London, W.C.; lithographers.

PARAMIN.—No. 330,068. Chemicals for photographic purposes. Major and Co., Ltd., Wincolmlee, Hull, Yorkshire; chemical manufacturers.

L. L. (Design).—No. 380,806. Photographic chemicals. Levinstein, Ltd., Crumpsall Vale Chemical Works, Blackley, Manchester; chemical manufacturers.

REGISTRATIONS RENEWED.

KODAK.—Nos. 154,848 and 154,850. By Kodak, Ltd, in 1891. (Classes 1, 15, and 39.)

KODAK.—No. 155,009. By Kodak, Ltd., in 1891. (Class 8.)

J. H. DALLMEYER (London).—No. 269,754. By J. H. Dallmeyer, Ltd., in 1905. (Class 8.)

TONIX.—No. 270,620. By John J. Griffin and Sons, Ltd., in 1905. (Class 1.)

TRADE MARKS REMOVED FROM REGISTER.

In the official language of the "Trade Marks Journal" the following trade marks have been "removed from the register through non-payment of renewal fees." Such non-payment is, of course, the method adopted by a firm having no further occasion for the use of a mark:—

SINNOX.—Nos. 269,073 and 268,993. Registered by Messrs. Marion and Co., Ltd., in 1905. (Class 1 and 8.)

BIOGRAVURE.—No. 269,014. Registered by the Rotary Photographic Company in 1905. (Class 39.)

New Books.

MORE FIGURES, FACTS AND FORMULÆ.—It seems not so very long ago that the "Photo-Miniature" devoted an issue—and a very useful issue it was—to collecting a miscellany of those facts, hints, formulæ, figures, and tables, which are in common use among photographers, the things which everyone now and again has need of and is glad to find within the compass of so compact a volume as our little New York contemporary. And now Mr. John A. Tennant has issued a companion volume containing a selection of similar subject matter which has been published since 1915. The contents include tables of depth of focus, hints on copying and enlarging, tests for developers, formulæ for developing, fixing, intensifying and reducing solutions and many other practical paragraphs dealing with such branches of work as sepia-toning, mounting and colouring. At present we believe the "Photo-Miniature" can be obtained only by sending English postage stamps or international coupons to the value of 35 cents. to Tennant and Ward, 103, Park Avenue, New York, U.S.A.

New Materials, &c.

WESLEM PASSE-PARTOUT FRAMES.—Messrs. Witt and Westley, Bank Chambers, Finsbury Park, London, N., send us some specimens of the ready-made passe-partout frames which they are now introducing to the notice of professional photographers, and at what appear to us to be exceedingly moderate prices. The frame, when hung on a wall, presents the appearance of a passe-partout made in the ordinary way, but Messrs. Witt and Westley have hit upon a very simple plan whereby the photograph can be inserted in the finished frame. This they do by leaving one side, either the top or bottom, of the backing card unattached to the glass, the binding strip of this portion being affixed to both sides of the glass. Thus the print can be slipped between the glass and the backing card and placed in position by manipulating it with the ball of the finger through a hole measuring about 1 in. by 2 ins., which is made in the backing card. It may be thought that there will be difficulty in inserting a print anything like the full size of the glass into a passe-partout made in this manner. Therefore, it should be explained that the frames are not intended for such full-size photographs, but for those of a smaller size than the frame which is provided with a mask, behind which the photograph appears. Messrs. Witt and Westley use exceedingly nice combinations of colour of mask and binding strip, so that the whole effect in both styles in which the frames are issued is extremely artistic. These two styles are brown (dark brown binding strips and buff mask) and grey (dark grey binding strip and white mask). They are made in two sizes—one 6¼ ins. by 4½ ins., with oval opening of texture art paper to take a postcard or cabinet print, and in 10 by 8, to take a whole-plate print. The respective prices are 4s. and 16s. per dozen. Photographers, we think, will be very pleased with these very well-made and artistic patterns of the passe-partout frame. A sample frame is offered by Messrs. Witt and Westley to *bona-fide* professional photographers.

CATALOGUES AND TRADE NOTICES.

THE INQUIRY MADE by a correspondent some little time ago for "Arco" frames has brought to our table the full price-lists of these and other frames made by Messrs. Whitehouse, Willetts, and Bennion, Ltd., Rex Works, Tything, Worcester. Their series includes all descriptions of metal and wood frames, the "Arco" series being those of plain, narrow, metal pattern, with, in one variety of the series, neat ornamentation at the corners. The firm also makes untarnishable metal frames in a great variety of patterns—oval, square, midget—and in a large range of sizes.

MESSRS. CHANCE BROS. AND CO., LTD., Glass Works, Smethwick, Birmingham, have just issued a price-list of optical glasses now being manufactured by them, and comprising a very wide range of crown and flint glasses, light and dense barium crowns, extra light, dense, and very dense flints, together with many others, the full optical properties of which are specified in the catalogue, which also gives indications of the liability of the glasses to tarnish or to undergo change with time. It is evident that Messrs. Chance have gone a very long way in replacing the optical glasses made by the Jena firm of Schott, and we have no doubt that with the less engrossing demands now made upon them they will be able to give the British opticians all the glasses they want.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

MONDAY, MARCH 24.

Bradford Photographic Society. Annual meeting.
City of London and Cripplegate Photographic Society. "Bromnil." G. B. Clifton.

TUESDAY, MARCH 25.

Royal Photographic Society. "The Photographer's Pencil." C. A. Hackman.
Halifax Scientific Society (Photographic Section). Slide Exhibition at Harrison Road.
Leith Amateur Photographic Association. "A Trip to Lakeland." C. S. M'Cabe.
Hackney Photographic Society. "A Country Cottage." (Prints.)
Chelsea Photographic Society. "The Thames from Richmond to Oxford." H. Felton.
Manchester Amateur Photographic Society. Monthly Exhibition: "Landscapes."

WEDNESDAY, MARCH 26.

Croydon Camera Club. "Useful Odds and Ends." W. F. Slater.
Ilford Photographic Society. "To the Land of the Midnight Sun." W. Sanderson, J.P.
Dennistoun Amateur Photographic Association. Mock Trial.
Photomicrographic Society. "Polarised Light as applied to Rock Sections." C. H. Caffyn.

THURSDAY, MARCH 27.

Liverpool Amateur Photographic Association. "Photography in the Great War." A. D. Pyke.
Brighouse Photographic Society. Exhibition of Members' Prints and Slides.
Camera Club. "Some Apparatus for Aerial Photography." Major Charles W. Gamble, R.A.F.
Hammersmith (Hampshire House) Photographic Society. "Telephotography." Dr. C. A. Swan.
Hull Photographic Society. "Members' Slides and Paget Colour Slides." Secretary.
Rodley and District Photographic Society. Members' Night.
Wimbledon Camera Club. Monthly Print Competition.
Richmond Camera Club. Annual Competition.

ROYAL PHOTOGRAPHIC SOCIETY.

MEETING held Tuesday, March 18, Mr. W. B. Ferguson, K.C., in the chair.

Mr. Newman F. Horne gave a demonstration of the finishing of bromide prints, and very admirably showed the manipulation adopted by himself in working up bromide prints and enlargements by the powder process—that is to say, by the application of crayon

powder. He made a great point of having the print firmly though temporarily attached to a sheet of glass, which allowed the work to be done very much better. For temporarily attaching the print he used the broad gummed paper binding sold as a substitute for string in tying parcels. The Conté crayon powder, as purchased, produced an intensely black deposit on the print, much blacker than could be got by using black lead, and with the advantage that it produced no metallic lustre. But in order to make it easier to moderate the depth of deposit, he prepared mixtures of the crayon powder and flour pumice of various strengths down to as low as 1 per cent. That is to say, he mixed the crayon powder with flour pumice in the proportions of equal parts, 1:5, 1:10, 1:20, 1:50, 1:100. Even the mixture containing only 1 part of the crayon to 100 parts of the flour pumice when rubbed over the print produced a tint which was scarcely visible when put on, but became so when parts of it were rubbed off, as in introducing white accents into the high-light portions. The flour pumice could be bought from the artists' dealers, or obtained at a very much lower price from the firm of Palmer, of Old Street.

In order to prepare a print, either glossy or matt for working up, the surface was first rubbed down with the flour pumice, applied with a stiff brush. Glossy prints would, of course, require longer treatment than those on matt paper. In the case of rough papers, such as Kodak Royal, it was necessary to use a softer brush in order to avoid rubbing off the silver deposit from the raised portions of the texture of the paper. In then proceeding to apply the crayon, it was his practice first to put a tint of the lightest mixture (containing 1 per cent. of crayon) over the whole surface with a wad of cotton wool. Shadow portions or other parts which required to be strengthened could then be treated with mixtures containing more crayon. In putting in stronger deposits the stumps of leather or paper were used. At any stage the work could be removed with india-rubber or with the material sold as plastic rubber by the artists' dealers. Mr. Horne preferred to use this latter as a fine point when removing the crayon from small outlines in the photograph; even a touch with the plastic rubber point removed the powder as though by absorbing it. In using ordinary rubber for the same purpose, a little coarser pumice powder, sold as grade 90, was used on the rubber. He had found the pencils sold for working up bromide prints of not the slightest use in comparison with the facility with which the Conté powder could be used. The powder was taken up on to stumps or cotton wool from "palettes" consisting of chamois leather fixed to a pair of small hinged boards, each measuring about 4 by 2 inches. When not in use, the two boards were folded with the leather surfaces in contact, and thus preserved the powder which still adhered to the leather from access of dust.

Dealing with the use of sepia powders, Mr. Horne employed the two commercial powders of this kind—namely, those of Conté and Winsor and Newton. They differed to quite an appreciable extent in colour, and thus by mixing them together in varying proportions the colour of any sepia-toned could be readily matched. As in the case of the black powder, he made up mixtures in which the crayon was diluted with flour pumice. For working up bromide prints of bluish colour, produced by development with amidol, a very small trace of ultramarine could be added to the black Conté powder.

Mr. Horne proceeded to deal with the treatment of bromide prints by scraping. He had used nearly all the knives sold for the purpose, and found that of Mr. T. S. Bruce a very satisfactory pattern. The chief essential was that the knife should be kept absolutely sharp by frequent stropping on a leather strop treated with razor paste, and that the print should be quite dry. The very sharp pen-nib print trimmers made admirable scalpels for scraping prints.

When fixing the worked-up print by holding it an inch or two from the steam of a boiling kettle it was found that the original surface of the print, whether matt or glossy, was restored, and in the case of a glossy print with some slight addition of gloss. Although he had tried, he had found it impossible to damage the print by melting the gelatine in this process.

A further method of working up, and one which he used in supplement to that with the crayon powder, consisted in the use of a solution of nigrosine spirit black, dissolved in alcohol, with the addition of 10 per cent. of chloral hydrate. The latter, by reason of its solvent action on the gelatine, enabled the emulsion surface to take the colour firmly. The work thus put on had the good feature of drying matt on matt prints and glossy on glossy prints, and though it could not possibly be rubbed off, it was removed in an instant by going over it with a rag moistened with alcohol. Mr. Horne showed examples of its use in conjunction with the powder process, and instanced the good use which could be made of the two in conjunction for working up prints which were required for half-tone reproduction. He dwelt briefly, and in conclusion, on working up with megilp and wax as mediums for pigment, referring to the formulæ for the latter of Mr. A. V. Godbold, which he had lately been using, and which, while appearing to have many great advantages, required, he found, subsequent treatment in order to remedy the effect of the process in giving a slightly greater gloss to the parts of the print which had received the greatest amount of work.

After some discussion, the very hearty thanks of the meeting were accorded to Mr. Horne.

EDINBURGH SOCIETY OF PROFESSIONAL PHOTOGRAPHERS.

The sixth meeting of the session took place on Monday, March 10, Mr. Young in the chair. Further discussion was raised with regard to the holiday closing scheme, and the secretary reported that the result of the postcard ballot showed a majority in favour of a ten days' holiday. This result it was decided to adopt as the decision of the society. Upon one or two motions and amendments, it was at length arranged that all those participating in the scheme should close at one time, and not at different periods, as had been previously proposed; and the actual date was fixed at August 18, and ten days thereafter.

Mr. Robert Burns, A.R.S.A., who had come to give a talk on pictorial composition, and to criticise a number of photographic prints submitted by members, was then introduced by the chairman. Mr. Young said that Mr. Burns had long been interested in photography, and had always been a friend of the photographer and one who appreciated the difficulties under which photographers worked. Mr. Burns, in commencing his address, explained that his father had been a photographer, and that he himself had begun to take an interest in photography at a very early age. With regard to composition, he asserted that there were neither rules nor laws by which good or bad composition might be judged; but that, on the contrary, it was merely a matter of personal taste, and it was in this light that he criticised the prints brought to his notice that evening. His remarks on each print formed a most instructive and interesting talk, and the good and bad points were carefully shown, and the reason given. Vignetted prints, the speaker mentioned, he did not care for, his reason being that thereby many difficulties were overcome—not by facing them, but by shirking them. He proceeded to explain that in a painting there were three kinds of composition, namely, that of colour, of mass, and of line. With the first the photographer could, of course, have nothing to do; and his necessary entire dependence on the remaining two rendered coloured subjects often very deceptive. A print of a boy blowing bubbles, after Millais' famous picture, gave illustration of this fact. The lecturer explained that the main composition of the original painting lay in its colour, and, therefore, such pictures as these were dangerous models for a photographer to base his work upon.

At the close of the criticism questions were invited. Mr. Campbell Harper, referring to the speaker's remarks upon a low-toned photograph which had been pronounced "flat," asked if it were possible to produce such a picture by photography which was not so. Mr. Burns, after some discussion on this point, replied that, while there were always exceptions to a rule, he thought on the whole that flatness was difficult to avoid.

Mr. Swan Watson then asked if there were really no elementary rules of composition upon which a beginner might base his study of the subject. Mr. Burns reasserted his former remark that there were no rules. To illustrate this point, he said that perhaps it might be asserted by some that, at any rate, no picture should contain lines which divided it either horizontally or vertically in

half. While such a basis of composition would certainly be difficult for a beginner to work upon, and as such should be avoided by him, it was, nevertheless, quite a possible basis for any artist of skill. This he illustrated by making a rough sketch of a sea-piece where the horizon line bisected the canvas. By adding a few lines below this, he so split up the lower portion as to make it appear smaller than the upper part, and thus had the effect of lowering the dividing line. Similarly, by adding a few lines representing evening clouds, he again brought the line back to the centre and created a bad composition. He then gave a more daring illustration of the same point in a rough outline of one of his own pictures where a line bisected the canvas not only horizontally but vertically, making four equal rectangles. Composition, in short, was not a law, but a sense of balance; and what seemed good to one might appear bad to another.

Mr. Barrie proposed a hearty vote of thanks to Mr. Burns for his most interesting talk, and hoped that the speaker might again favour the society at some future meeting. This Mr. Burns very kindly offered to do. The meeting then closed.

CROYDON CAMERA CLUB.

The annual rummage sale was held last week, in cinematograph announcement fashion: Controlled by the Council. Directed by Mr. S. G. Klitz, the noted ivory-hammer executant. Supervised by the president, Mr. J. Keane. Assisted by Mr. H. King. Members happily disposed of much apparatus, largely of the knacker's yard order, which, with avidity, was acquired by others whilst under the hypnotic influence of the auctioneer, perpetually lost in admiration at the wonderful quality of the goods he was disposing of.

And the evening went brightly, just as this world, with all its underlying sadness, in the main revolves gaily, but all knew poor "Old Optics" had gone never to return—the last one to wish any evening to be spoilt on his account, one who loved the club well, and in turn was held in the highest regard by all. In feeling terms the president alluded to the loss sustained by the photographic world in general, and the club in particular.

A recognised authority on optical matters, with an extensive and sound all-round photographic knowledge, Mr. Piper's death causes an ugly gap in the club considered impersonally. In a personal sense many friends will keep now only a memory ever fresh. Never speaking at meetings unless compelled, and often compelled; ever ready to assist with advice, and spare no pains in doing so; with mental reflex not of the quickest a paradox might momentarily nonplus, but pity the originator of any such twisted proposition when thoughts were marshalled; a plucky patient when on his back for many weary months, facing like a true sportsman what all will have to face some day—such was the late C. Welborne Piper, or "Old Optics" as affectionately known at the club.

It seems almost yesterday when an ideal night for an air raid prompted a member to suggest to him that an early train back to Blackheath (an awkward cross-country journey) was eminently desirable. The answer was characteristic: "If you think I am going to allow those contemptible Huns to interfere in the slightest with my arrangements you are gravely mistaken," he said with cold severity. On a previous occasion when returning home he and others had enjoyed to the full a nocturnal Zeppelin, bombs being dropped in close proximity.

Ever difficult to get Mr. Piper on his legs to speak, when by direct request or subtle artifice he spoke. words were brief, but always sufficient and to the point. But on one well-remembered occasion he did wax exceedingly voluble. It arose in this way—a "conversational" evening was on, and a member who tries his best to keep things going first declaimed on a subject which previous inquiry had ascertained Mr. Piper knew nothing about. Nevertheless, the dissertation was concluded with an express proviso that everything which had been said was "entirely subject to the full approval of, or correction by, Mr. C. Welborne Piper." The tag caught on, and chats by experts on printing papers, dry-plates, and other things were all wound up with the emphatic reservation alluded to. Poor Piper stood about six tags, and then the smoulder burst into flame. He rose, took off the gloves, and smote all round the ring the astonished original sinner. A really creditable performance, as delightful as it was unexpected. Would he could repeat it, but that, alas! cannot be, and so farewell, old friend.

THE OPTICAL SOCIETY.

Meeting held Thursday, March 13, the president, Professor F. J. Cheshire, in the chair.

Major Charles W. Gamble, R.A.F., delivered a lecture dealing very comprehensively with the methods and apparatus employed in aerial photography during the war. He traced the stages through which cameras for photography from aeroplanes and airships had passed as the result of development at the hands of those in the Royal Flying Corps and the Royal Naval Air Service, and subsequently by the photographic section of the Royal Air Force, formed after the amalgamation of the two Services. A great deal of what he said in reference to these pieces of apparatus is contained in the article which appears on another page, and which was in preparation at the time of his lecture. But he was fortunate in being able to show to his audience an example of practically every type of camera used by the British Forces in the course of the war, as well as several used by the French and the Italians and a number captured from the enemy. The focal-plane shutter, although by no means a perfect instrument, had been almost universally employed, first on account of the short exposures which could be given, and, secondly, on its facility for use with lenses of different focal lengths on the same camera. On the other hand, its liability to derangement was a serious drawback, but one which was in part remedied as time went on by making the shutter a separate unit which could be withdrawn from the camera and replaced by a fresh shutter. Major Gamble stated that the Germans were the first to adopt this plan.

It was at first assumed that the most rapid plates were the best for the purpose. Although exposures in good light did not require plates of maximum sensitiveness, yet it was desirable to carry out work late in the day and often when the light was poor. Nevertheless, experience has shown that the capacity of the plate for giving a high degree of density was a quality which ranked in importance with the general sensitiveness. The earlier practice was to use orthochromatic plates, which for many purposes possessed a sufficient degree of colour-sensitiveness. The tendency, however, was to adopt panchromatic plates more and more largely, and Major Gamble estimated at the time of the armistice the proportion of panchromatics in use would amount to from 75 to 80 per cent. of the whole. Filters were in many instances made from optical flats, as necessitated by the length of focus of the lenses and the high degree of definition called for in the negative; but good use was made of a film filter placed in the diaphragm aperture. Though liable to damage, they were found to render satisfactory service for a considerable time, although any deformation would impair the definition of the lens.

A large number of lantern slides were shown illustrating different types of camera and fittings, and a further series showed the results obtained in military and naval work, concluding with some of the surrender of the German warships.

A Want of Investigation.—An unusual experience recently occurred to a prominent professional photographer in the suburbs. Being asked by a lady to photograph a children's party, to be held in the early afternoon, he inquired whether it was to be photographed indoors or out-of-doors. "In a very large room with glass roof," replied the lady, on hearing which the job was undertaken, and on the day appointed a heavy 12 x 10 camera and accessories were carried by hand to the address given. The information afforded about the roof proved to be correct as far as it went, but did not include the fact that it was glazed with orange glass. Despite the prevailing hue the photographer failed to regard this feature in a rosy light, and sadly returned with plates unexposed. Had he been provided with a small camera fitted with a $f/4.5$ anastigmatic lens, possibly the work might have been undertaken on rapid panchromatic plates, but one does not usually carry a reserve of this kind to meet such a contingency.

Commercial & Legal Intelligence.

A Retoucher's Claim.—At Greenwich County Court, last week, his Honour Judge Granger had before him a case in which Emily Florence Warren, retoucher, of Melbourne Grove, Dulwich, sued Gertrude Mayhew, who carried on a photographic business in Sydenham Road, for £3 15s.

Plaintiff said her claim was for a week's salary, a week's money in lieu of notice, and for 5s. deducted "during the strike." On February 13 (she stated) a 10s. note was missed from the cash box at the studio, and she and another young lady were accused and told to "clear out." They went, and a third young lady "came out in sympathy." She admitted she was late on three mornings during the Tube strike, and said the 5s. had been deducted for this.

Defendant said plaintiff had received notice to leave on February 8.

Plaintiff: I had given her notice.

Defendant, continuing, said plaintiff lived but three-quarters of an hour's walk from the studio, so the Tube strike could not have affected her.

His Honour: Ah, but people have lost the art of walking, they have to ride every step.

Defendant added that plaintiff did not work out her notice.

In the result, his Honour gave judgment for plaintiff for £1 15s.

NEW COMPANIES.

Ambrotox Co., Ltd.—This private company was registered on March 11, with a capital of £1,000 in £1 shares. Objects: Manufacturers of and dealers in celluloid products, photographic chemists, etc. The subscribers (each with one share) are:—P. E. Jeffs, 30, Cobbs Road, Ilford, clerk; H. O. White, 179, London Road, Kingston Hill, Surrey, clerk. First directors are to be appointed by the subscribers. Solicitor, G. C. Bingham, Capel House, E.C.

News and Notes.

The Photo-Micrographic Society.—The next ordinary meeting will be held on Wednesday, March 26, at 7 p.m., at King's College Bacteriological Laboratories, 62, Chandos Street, W.C., when Dr. B. P. Haigh will give a lecture, entitled "The Internal Structure of Metals." Visitors are heartily invited, and cards of invitation may be obtained on application to the Hon. Secretary, J. G. Bradbury, 1, Hogarth Hill, Finchley Road, Hendon, N.W. 4.

Memorial Photographs.—In the House of Commons, on March 20, Lieutenant-Colonel Moore Brabazon asked the Secretary to the Treasury whether he was aware that the Imperial War Museum were minded to include a collection of photographs of all officers of his Majesty's Services, and whether he concurs in the expenditure which such a collection would entail on the public purse? Mr. Baldwin: The Committee of the Imperial War Museum have issued a notice inviting relatives of officers and men of his Majesty's Forces who have lost their lives during the war, to present photographs of them for preservation in the Museum. It is not expected that this collection will involve any considerable expenditure, and I do not think that this is a matter in which the Treasury should interfere with the discretion of the Committee.

Messrs. Ross, Limited, are, we are glad to see, taking the lead among British lens makers in drawing the notice of the photographic public to the achievements of British opticians, as shown particularly by the instruments which have been provided for aerial photography. The Supplement which accompanies the present issue of the "British Journal" cannot be said to overstate the reputation or the latter-day achievements of this British firm, which within a few months will have completed ninety years of existence. With the curtailment of the output of instruments for the services work which has necessitated a three fold expansion of the Ross factories—the making of lenses for the photographic public can now engage the firm's activities, and attention is drawn to two of the many notable Ross objectives, namely, the Xpres anastigmat of $f/4.5$ aperture, and the Telecentric, the latter a telephoto objective of unique type, giving anastigmatic definition at a full aperture of from $f/5.6$ to $f/6.8$, and requiring a camera extension of only half its focal length.

A Reduction in Plate Prices.—As announced in Ex Cathedra a reduction in the price of plates was made by the British manufacturers to come into operation on March 11 last. The reduced price is such that quarter-plates are sold at 3s. per dozen, other sizes undergoing an approximately similar reduction of those which came into force on August 1, 1918. In order to preserve the continuity of the fluctuations in price we may set forth the successive rises and the present reduction as follows, the figures being those for one dozen quarter-plates:—

	s.	d.
Before June 16, 1913	1	0
June 16, 1913	1	3
March 13, 1915	1	6
February 29, 1916	1	10
March 1, 1917	2	3
February 5, 1918	2	9
August 1, 1918	3	8
March 11, 1919	3	0

The present change in price is thus the sixth which has been made since the outbreak of hostilities.

Striæ in Optical Glass.—Various types of striæ in optical glass, classified on the basis of visible appearance, are described, and photographs shown, in a paper by L. E. Dodd and A. R. Payne, of the U.S. Bureau of Standards, presented to the American Physical Society. Certain of these types are then discussed from the standpoint of their nature and probable origin. A relationship between gas bubbles in the glass and striæ is pointed out. The application of pressure to the molten glass is advocated as a preventive, not only of bubbles, but also of those striæ associated with bubbles. Another probable source of the more numerous striæ is given as the separation of lead, or its oxide, in the lead glasses. Striæ having such origin, however, are more localised, near the walls and bottom of the pot, and may be reduced to a minimum in number by proper heat treatment and stirring. It is thought that striæ in the more central part of the glass mass in the pot, which are regarded as being mostly associated with bubbles, may be largely prevented by application of pressure, and that thereby the per cent. of good glass may be considerably raised from the present amount of 20 or 25 per cent. of the total melt. The experimental application of pressure is proposed as a special research, primarily of commercial value, but indirectly of scientific value by its possibility of opening the way to the manufacture of the larger lenses free from defect.

Death of Mr. G. W. Secretan.—We regret to have to announce the death, on March 7 last, at the age of sixty-six, of Mr. G. W. Secretan, of Tufnell Park Road, London, a photographer of long and wide experience, and one who during the past few years had turned his attention with very great success to certain improvements in the processes of development and fixing. Mr. Secretan invented a preparation which he named "Serteka," and which, when added to the amidol developer, imparted to the latter very remarkable keeping qualities. We have no idea what is the chemical nature of this substance, but certainly, as we assured ourselves at the time of its introduction, its addition to the amidol developer renders the latter one which can be kept and used with almost the freedom from loss of energy which is the property of other developers, such as hydroquinone or M.Q. Mr. Secretan also devised a further preparation, sold as "Unisol," for the purpose of effecting economy of hypo by its addition to the fixing bath. Our opinion is that there is less to be said for this preparation than for the preceding, but it may be hoped, in the event of the discontinuance of the sale of these substances, consequent upon Mr. Secretan's death, that the photographic world may learn something of the chemical composition of the amidol preservative. It would appear that it marked the use of some quite distinct compound for the purpose, and publication or even some suggestion of the work which Mr. Secretan carried out might easily lead to still more fruitful results in the same direction.

Retail Business Licences.—As from last Monday, the Order made by the Minister of National Service under Defence of the Realm Regulation 8AA, rendering it necessary to obtain a licence before a person can establish a new retail business or a new branch

of an existing retail business, is to be administered by the Ministry of Labour. Forms of application for licences will be obtainable at all Employment Exchanges. The ten divisional councils in Great Britain which have been formed to co-ordinate the work of local advisory committees are being invited to advise the Minister in the administration of the Order.

Inquiries regarding licences should be addressed to the Secretary (New Business Licences), at the following addresses:—

London and South-Eastern (City and Metropolitan Police District, Kent, Surrey, Sussex).—Hotel Windsor, Victoria Street, London, S.W. 1.

South-Western (Gloucester, Wilts, Dorset, Somerset, Devon, Cornwall, Hants, Isle of Wight).—5A, Union Street, Bristol.

Yorks and East Midlands (Notts, Yorks (excluding Cleveland), Derby (excluding Glossop and New Mills), Lincoln).—Harewood Barracks, Woodhouse Lane, Leeds.

West Midlands (Staffs, Shropshire, Hereford, Worcester, Warwick).—Queen's College, Paradise Street, Birmingham.

South Midlands and Eastern (Norfolk, Suffolk, Cambridge, Oxford, Huntingdon, Bedford, Berks, Bucks, Northants, Leicestershire, Rutland, Herts, Essex).—80, Westbourne Terrace, Paddington.

North-Western (Lancashire, Cheshire, Derbyshire (Glossop and New Mills District), Isle of Man).—New Arts Buildings, Liverpool.

Northern (Northumberland, Durham, Cumberland, Westmorland, Yorkshire (Cleveland District).—47, Pilgrim Street, Newcastle-on-Tyne.

Wales (all Wales and Monmouthshire).—27, Bute Street, Cardiff.

Scotland (all Scotland).—15, Athol Crescent, Edinburgh.

Correspondence.

**** Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

**** We do not undertake responsibility for the opinions expressed by our correspondents.*

CINEMATOGRAPH OR KINEMATOGRAPH.

To the Editors.

Gentlemen,—In your issue of March 14, Mr. Travers J. Briant doubts whether I am correct in asserting that it is usual in English words derived from Greek ones beginning with or containing "k" to convert that letter into a "c."

I have taken the trouble of classifying all the words beginning with "c" and "k" in a moderately large encyclopædia, which should afford a fair test, and find, as a result, that the Greek "k" is changed into "c" in no less than 94.7 per cent. of cases.

Mr. Briant has simply discovered a few of the exceptions that prove the rule, and is trying to make a rule of the exceptions—which, by the way, mostly belong to the Hanoverian period.

There is an interesting anecdote in Hopwood's "Living Pictures," tending to show that the future builder of the Anglo-French *entente* (Edward VII.) instinctively did not like the look of the prefix "kine." Speaking of the early motion picture apparatus invented by Mr. Birt Acres, the work states: "Brought out in January, 1896, as the 'Kinetic Lantern,' this term was abandoned the following March in favour of the name of 'Kineopticon.' Being called to give an entertainment before the Prince of Wales in July, the inventor found, to his surprise, that the programmes issued under Royal auspices referred to his invention as the 'Cinematoscope.' What could a loyal photographer do except follow the same course, as Mr. Acres actually did? Cinematoscope it was by Royal dictum, and Cinematoscope it remains to this day."

I have hitherto purposely abstained from dealing with the question of pronunciation, which is really irrelevant. The vast majority of people pronounce cinema as "sinema," thereby probably settling the point for dictionary-makers; but there is no valid reason why those with a liking for originality should not pronounce it as if it began with a "k." There are two different ways, for instance, of saying "Cicero," and, if we must make a choice of evils, a variable pronunciation is much less objectionable than a discrepancy in spelling.—Yours faithfully, A. LOCKETT.

THE ASSISTANT QUESTION.

To the Editors.

Gentlemen,—I should like, with your kind permission, to tell your correspondent "E. F." the reason why master photographers pay their assistants the low wages they do. Master photographers may be grouped roughly into three classes, which I place in the order of their importance as employers:—A, the man who is in the business solely for the profit he can make out of it, who usually runs several establishments, and is rarely a practical workman himself; B, the higher-class man, whose vanity is such as to prevent his systematically making money as A, who squeezes the ball, strikes attitudes, and exudes phrases, while the staff turns out the work; C, the general pettifogger who, though he may be taken more seriously as a photographer, scarcely counts as an employer. These men, whatever their system, or no system, of business may be, are out for profit, and their profit is obtained by selling as many bits of glorified cardboard to as many fools as may be found to buy them; the fact that Mr. A picks up half-crowns in East London as quickly as a boy finds pebbles on a sea-swept shore, or that Mr. B pockets guineas in the West as deftly as a girl plucks flowers in spring, is no earthly reason why they should share the booty with that quite unskilled and rather shiftless trio—Mr. Washout the "operator," Miss Washeye the "retoucher," and Mr. Washup the "printer."

Your correspondent suggests that "the profession should be taken in hand and modelled on the organisation of the chemists and druggists"—really, the humour of the thing appeals to me. To begin with, how can you possibly organise such detached individuals as Washout, Washeye, and Washup? All three are against one another, and each of the three tries to curry favour with the "boss" at the expense of the other two; Mr. Washout grumbles at Mr. Washup's prints, and Mr. Washup growls at Mr. Washout's negatives; while Miss Washeye, with a woman's weapons, scores against them both!

Then, Mr. Washout and Miss Washeye, at all events, are quite superior persons, who could not possibly be mixed up with trade unionism and the working-class, and it should always be remembered that Mr. Washout's ambition is not to strengthen his position as a paid servant by combination with his fellow-workers, but, rather, to blossom out as Mr. C, with the ultimate hope of exploiting his late confrères à la Mr. A, while Miss Washeye, supposing all matrimonial chances to have failed, is supported by the hope of some day opening up as Miss B, and using to her own advantage the labour of Washout and Washup! Washup alone in this respect is a doubtful starter and possible trade-unionist; of taciturn mood, his ruminations in the ruddy depths are known only to himself and the sable demons that possess him.

Technical education? Imagine an emancipated Washup, his poor head full of symbols and equations, being content to spend his life in a black cellar performing his old trick:—6068, one, two—stop! One, two—stop! One, two—stop! 6069 (bit denser), one, two, three—stop! One, two, three—stop! One, two, three—stop! And so on. Flash up? Drop more bromide! Hang back? Warm your developer! Skill! Why, girls in their teens can do it, and *do* do it. Picture Miss Washeye having mastered facial anatomy and being proficient in (say) drawing from the antique, coming back to pore over Mr. Washout's atrocities! Gentlemen, *it can't be done.*

The whole thing lies at bottom in the hands of the blockhead public. So long as it is satisfied with West End piffle and East End smudge work, turned out by children and duffers, so long will things remain as they are; employers will not study their profession with a view to the production of true portraiture until they are forced to, and they will not pay such wages as will make qualification on the assistant's part worth while until the standard of the craft is raised to such a pitch that it cannot be run by boys and girls and certain indefinite persons, who, without a shadow of justification, imagine themselves to be artists.—Yours very seriously,

SIMPLE SIMON.

London, S.W.

To the Editors.

Gentlemen,—Within the space of one long life photography as a means of livelihood has had its birth, adolescence, and arrived at full maturity. Like all modern industries, where it has been possible, it has been developed on modern capitalist lines. The recent statement of a member of a North Country Master Photographers' Association that he was in photography purely as a commercial speculation confirms this, and there are other well-known instances.

The "B.J." some few years ago, in recording the death of the owner of many studios devoted principally to the production of cheap oil paintings, told us the number of thousands of pounds a year which he made out of it. While doubtless many of us would do the same if we only knew how, the fact remains that it is the personal worker rather than the capitalist to whom we must look for the advancement of photography so far as portraiture goes, and also for the fostering of those relations between photographers which make for what we call the professional spirit as distinguished from that of the trader.

On the purely technical side, the improvements will probably come from the laboratory of the photographic material manufacturer and the workshop of the maker of scientific apparatus; but even here it will be the individual experimentalist rather than the proprietors who will make the discoveries, though no doubt the run of a well equipped laboratory such as is at the disposal of Dr. Mees will render possible research work that could not otherwise be undertaken.

For these reasons therefore it is the personal worker who needs to be kept on his feet, whether at the moment he happens to be working direct for the public, or as an employee of some one else.

Membership of the P.P.A. must, of course, be open to all employer photographers engaged in trading on their own account whether mere commercialists or men with a little more idealism like Mr. Adams, but it is quite evident that that body can do very little officially in the way of organising tuition or training of assistants.

What I think should be done is that Mr. Adams and a few people like minded, not necessarily all employers, should get in touch with each other and exchange views.

In any case there is certainly a need for an association consisting of employees only, the members of which should automatically cease to belong to it (except perhaps in an honorary capacity) directly they ceased to be employees and joined the ranks of independent workers and employers. At the moment the organisation of a trade union on fighting lines is neither possible nor necessary, though if the period of increased trade prosperity—promised for "peace" time, but hardly as yet in sight—fails to materialise, there is no knowing how soon a body able to negotiate on behalf of its members may be required. Before the war there were at intervals of a few years two or three strong attempts to form such a union, the last of which only just failed, and that mainly I think through the defection of the originator of the agitation.

When a meeting was called in London I gave my printer carte blanche to attend, say what he liked, take what office he liked, etc., and he brought back word that only about a dozen (all men I think) attended, and they seemed afraid to open their mouths. A London acquaintance of mine (Mr. Frank Colebrooke), not unknown I believe to the editors, was some time ago successful in organising the employees of an industry allied to photography, and I suggest that if he and a few brainy assistants were to put their heads together, some representative organisation of photographic employees might be brought into existence which would be able to assist such little groups of employers as Mr. Adams might succeed in rallying round him. Several months ago, before this correspondence began, I had it on my mind to write to Mr. Adams, "Thermit," and a few other of your correspondents on the desirability of getting into touch with each other and exchanging views, being convinced that the personal worker needs the help to be got from association with his fellow workers to "keep his end up."

About twelve months ago I mentioned the question of organisation of photographic employees to Mr. Colebrooke and gathered from him that others had done the same thing, but nothing apparently has happened.—Yours truly,

LOOK FORWARD.

Answers to Correspondents.

SPECIAL NOTICE.

In consequence of general reduced supplies of paper, as the result of prohibition of the importation of much wood pulp and grass, a smaller space will be available until further notice for replies to correspondents.

Moreover, we will answer by post if stamped and addressed envelope is enclosed or reply: 5-cent. International Coupon, from readers abroad.

The full questions and answers will be printed only in the case of inquiries of general interest.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

W. S.—The Professional Photographers' Association, of 89, Albany Street, London, N.W. The fee for membership is 5s.

J. H.—We do not know a firm supplying the particular kind you want, but you might try Mr. J. Elliott, Parade Works, Nottingham.

A. P.—Aprons and overalls of rubber or waterproof material are supplied by the Altrincham Rubber Company, Altrincham, Cheshire.

D. R. H.—The stains are evidently due to imperfect fixation. There is no means of removing them. You should make it a practice to pass all prints through two hypo baths in succession.

H. M.—Machines for perforating numbers which are used for paper, but presumably can be obtained suitable for perforating film, are supplied by E. M. Richford, 9, Snow Hill, London, E.C.

F. H.—We are certainly of opinion that prices of cameras are not likely to fall within the next six months. We think it more likely that new models which may be produced this year will be higher in price than those at present on the market.

C. T. M.—The best solution for cleaning developer stains from porcelain dishes is one of potassium permanganate, say 5 or 10 per cent. in strength, with a fair amount of strong sulphuric acid added. This can be used repeatedly until exhausted.

G. W. WILSON.—There is a complete file of the "British Journal" in the Library of the Patent Office, 25, Southampton Buildings, London, E.C. You can consult it there without any formality and with more facilities for making notes than we could offer you at this office.

AD ASTRA.—Your room is not very well adapted for a studio, but will, we think, give fair results if you put in glass, making the skylight about 6 ft. wide and 9ft. long. We do not think you will do much good by trying to work through the doorway. It will be better to get a short focus lens, say 8½ ins., for cabinets, and work along the studio in the same direction as for half-lengths and heads.

K. E.—So far as we know, protection under the 1911 Copyright Act is not obtained automatically in Canada as it is in the case of some other British dominions, such as Newfoundland. That being so, the only course is to apply to the newspaper companies, pointing out that the photographs are your original productions. You might threaten legal action; but if the people know the law of the matter (as they probably do), they will be inclined to resist any claims, whereas they might admit the moral justice of your claim if made amicably.

G. T.—Dry-mounting by means of a flat-iron is something of a makeshift, but you ought, nevertheless, to be able to get satisfactory adherence without mackings. One of the best irons for the purpose is that sold for ironing billiard tables, having rounded edges, which avoid marks on the print. A sheet of stout paper, such as

is used for typewriting, is sufficient protection between the iron and the print. As regards temperature, with most tissues the iron is sufficiently hot if you can just bear to touch it for an instant with the tip of the finger.

G. R.—The best and most customary method is to have the titles set up in type, or if type is not available to draw them on a large scale, and then to photograph down to the required size on a process plate—of course, photographing a considerable number of titles on the one plate. The title strips are then cut through to the glass, and the negative (when dry) stripped off on to the landscape negative by means of hydrofluoric acid. A touch of gum will hold the strip in place, and it is further fixed by the varnish, which is usually given to view negatives.

DOROTHEA.—There are a whole series of soft-focus lenses by American makers, namely the Portland, for which Messrs. Sinclair are the agents here, the Verito for which Messrs. Butcher are agents, and the Smith which, so far as we know is not sold in this country. But you need not buy an American lens if, as you say, you would prefer one of British make. Of these there is the Dallmeyer portrait lens and the Cooke portrait lens, both of which are provided with an adjustment whereby a certain amount of diffusion can be introduced.

M. J.—You will have to get a licence to start a new retail business, but we should imagine that no licence is necessary if, as we assume, you have bought an existing business. However, you could satisfy yourself as to this by application to the office which relates to the West of England, and is situated at 5A, Union Street, Bristol. If you do not carry on the business in your own name you will, of course, have to register the business at the annual cost of 5s. Particulars from the Registrar of Business Names, 59, Russell Square, London, W.C. 2.

MARBELLA.—It is quite true that lenses marked with the same *f*/No. and in fact having actually the same relative aperture are not necessarily identical in speed. The thickness of the glass and the number of surfaces of the lens components which are exposed to the air affect the rapidity though not to a very great extent. There are, however, no comparative figures published relating to lenses on the market, and for practical purposes, certainly in the case of lenses all of modern type, you can afford to neglect the differences. A paper on the subject, which is a partial study of the question, is that by Mr. R. W. Cheshire, published in the "B.J." for August 2 and August 23, 1912.

M. N.—Extra focal length is a term applied to the distance from the object to a point within one focal length of the lens, and similarly to the distance from the image to a point within one focal length of the lens. For example, when copying same size there will be one extra focal length in the direction from the image towards the lens, and likewise one in the direction from the object towards the lens. By thus, as it were, leaving out the consideration a focal length on either side of the lens, the optical calculations in copying or enlarging become greatly simplified. For a fuurther explanation you may refer to an article, "Some Simple Lens Arithmetic," in the "B.J." of June 8, 1917, obtainable from our publishers, price 4½d.

H. M.—The prints have all the appearance of having been fixed in a hypo bath that was acid, or became acid by fixation of a large number of prints in it. In our experience self-toning paper, in order to obtain a thorough permanence, requires to be fixed in a bath which has been made alkaline with ammonia or carbonate of soda, or, perhaps better than either, with sodium bicarbonate. Also, it requires to be frequently renewed or further dosed with alkali in order to neutralise the acids which are dissolved out of prints. At the same time we are bound to say that your prints strike us as exceptionally bad specimens of fading.

T. E.—Various preparations have been patented or introduced for the purpose. One such, of French origin, also contained the developer, and was compounded of—

Magnesium picrate	81 parts.
Sodium sulphite (anhydrous)	544 parts.
Sodium hyposulphite (hypo)	250 parts.
Diamidophenol	125 parts.

This powdered mixture was dissolved in water to the extent of about 4 gms. per 100 c.c.s. (about 20 grs. per ounce), and the exposed plate or print having been placed in it in the dark, the further operation could be continued in daylight or other actinic light. None of these mixtures have come into practical use.

B. J. PYRO-SODA.—We see in the instructions for making the pyro-soda developer by the "B.J." formula the item that the mixture of soda sulphite and metabisulphite after dissolving should be boiled for a minute or so. As we make up this developer in large quantities and have good cause to be grateful to it for the freedom from stain on both negatives and prints, we should be glad if you would tell us whether there is any real advantage in boiling the mixture. In making up the solution by the gallon it is an inconvenience to have to boil, and if there is no really good object served we should be glad to dispense with this part of the preparation.—C. F. G. Co.

If you do not keep the stock solution for any great length of time, say for not more than four or five weeks, there is no advantage whatever in boiling the mixture of metabisulphite and sulphite. At the same time you should preferably dissolve these salts in boiling water, that is boiling water poured on to the dry mixture. There is no necessity to boil the full amount of water specified in the formula. Enough to dissolve the salts is sufficient.

SULPHITE TROUBLES.—I am dissatisfied with the tones which I get by the regular method, using the bromide-ferricyanide bleach and toning with sulphide. What I should like to get is a tone similar to what one sees on the postcard portraits in the shops of the Rotary Company. I work, as I think, exactly to instructions, well washing prints between bleaching and sulphiding, but perhaps there is some matter of importance which you will be able to mention for my assistance.—T. W. D.

The commercial cards which are sold by the stationers are most of them toned by the hypo-alum method, which gives the characteristic purplish sepia which is the preference of the postcard printing trade. Dependent on the brand of paper which you use, the bleach-and-sulphide method yields tones which are more brownish and, as we think, more pleasant. If the results are poor in tone the most general cause is insufficient development of the prints in the first instance. See our note last week under Ex Cathedra. There is no need to give more than a couple of minutes' washing between bleaching and sulphiding. To wash for a longer time may give prints which are less satisfactory in colour.

The British Journal of Photography.

Line Advertisements.

Charges for Insertion.

Since advertisements cannot be inserted until fully and correctly prepaid, senders of line announcements are asked to bear in mind the scale of charges. They will thus save themselves delay in the publication of their announcements. A Schedule by which an advertisement can be correctly priced will be sent on request.

Net Prepaid Line Advertisements.

12 words or less	1/-
Extra words	1d. per word.

(No reduction for a series.)

Special Note. Box Number Advertisements.

"Box No." and office address	charged as 6 words.
For forwarding replies add ...	6d. per insertion for each adv't.

If replies are called for this latter charge is not made.

Advertisements cannot be inserted until fully and correctly prepaid.

Orders to repeat an advertisement must be accompanied by the advertisement as previously printed.

Advertisements are not accepted over the telephone or by telegram.

The latest time for receiving small line advertisements is 12 o'clock (noon) on Wednesdays for the current week's issue.

Displayed Adv'ts should reach the Publishers on Monday morning.

The insertion of an Advertisement in any definite issue cannot be guaranteed.

HENRY GREENWOOD & CO., Ltd., Publishers,
24, Wellington Street, Strand, LONDON, W.C. 2.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3073. Vol. LXVI. FRIDAY, MARCH 28, 1919. Price Twopence.

Contents.

	Page
Ex Cathedra	153
Rational Developments	154
An Easy Method of Silvering Mirrors. By James Graham	155
Practicus in the Studio. By Practicus	156
Some Lenses for Professional Photographers. By E. M. Spiers	158
Some Effects in Enlarging. By J. Walter Doubleday	158
Photographic Raw Paper Base	160
Death of Mr. G. Watmough Webster	160
Assistants' Notes	161
Exhibitions	161
Forthcoming Exhibitions	161
Patent News	162
New Apparatus, etc.	164
Analecta	165
Catalogues and Trade Notices	165
Commercial and Legal Intelligence	165
Meetings of Societies	165
Correspondence—	
Are Material Prices to Fall Soon?—The Assistant Question—The Efficiency of the Focal-Plane Shutter	166
Answers to Correspondents	167

SUMMARY.

We regret to announce the death, on Saturday last, of one of the veterans of photography, Mr. Watmough Webster, at the age of 76. (P. 160.)

In a contributed article Mr. James Graham gives working details for silvering mirrors by means of the process in which the glass is first prepared with stannous chloride and the silver reduced with formaline. (P. 155.)

A lecture by Mr. Newman F. Horne before the South London Photographic Society contains many practical hints from this experienced worker on the use of the chromium intensifier. As an alternative to the use of Farmer's reducer, Mr. Horne recommended bleaching the negative in the ordinary sulphide-toning bleach, washing thoroughly, and re-developing only to the required degree with amidol. (P. 166.)

A number of useful hints on the making of enlargements, including the production of soft effects from negatives of normal definition, are contained in an article by Mr. J. W. Doubleday from "Camera Craft." (P. 158.)

A few of the maxims which require to be observed in development are the subject of an article on page 154.

Some particulars of the measures being taken for the manufacture in this country of photographic raw paper base are quoted from the recent prospectus of Messrs. Wiggins, Teape. (P. 160.)

A few of the additions to his regular business which may appropriately be made by a photographer are suggested by Mr. E. M. Spiers. (P. 158.)

The article this week by "Practicus" is a talk upon the considerations which should govern the arrangement and furnishing of the reception room. (P. 156.)

An interesting exhibition of photographs by Dr. O. Atkin Swan, President of the Royal Photographic Society, is now open, until April 5, at Hampshire House, Hog Lane, Hammersmith. (P. 161.)

Apparatus for the development and drying of cinematograph film is among the patents of the week. (P. 162.)

In the production of new styles of photographic print the transfer bromide papers can render good service. (P. 154.)

The use of a vest-pocket camera as a substitute for the bulkier instrument necessitates due caution against over-development of the negative. (P. 154.)

In making enlargements from very flat negatives good use can be made of the extra slow gaslight papers in conjunction with a high-power light-source. (P. 154.)

EX CATHEDRA.

Enemy Cameras. We are glad to see that our contemporary, "The Photographic Dealer," is actively interesting itself to put a stop to a species of trading with the enemy which, though small in amount, is nevertheless quite indefensible. It appears that in Cologne and other places in the occupied portion of Germany cameras of German make can be bought at not a very much higher price than that before the war, yet one which at the greatly depressed value of the German mark enables the buyer to dispose of the camera at a good profit on bringing it to London. It is stated that dealers in London are being asked to purchase these instruments. The Photographic Dealers' Association has taken the matter up, and it may be hoped that prompt measures will be taken to see that this illicit trading is speedily stopped. There can be no objection to Army officers in the occupied country buying such photographic supplies as they want from the only available sources, namely, the German dealers, but the practice of snatching a paltry profit by bringing the cameras to London for sale is one which surely should be immediately prohibited by the authorities on their notice being drawn to it.

* * *

Cycle Portraits. We were recently shown a most artistic portrait photograph of a feminine client of a professional friend. The lady was riding her bicycle along a delightful stretch of country road. The portrait was a really delightful piece of work, and showed to perfection the poise of the head, the easy carriage of the rider, together with the perfect grace with which some women have learnt to cycle. This is an idea that might be well worth following up, for if well done a portrait of this kind should be a good business bringer, and is far in advance of the portrait in which a stationary cycle is "ridden" in the studio. The real thing offers no special difficulties in the way of making a satisfactory picture, nor need the operator think that a reflex is essential. A good hand-camera is desirable, but the picture to which we refer was made with an ordinary field camera. In this case the picture was focussed on the ground glass, the cyclist being requested to stand on a certain spot marked with a couple of smallish stones. She then retired, and rode slowly towards the camera for the exposure to be made. It will be found best, if possible, to make the actual exposure while the cyclist is free-wheeling, in order to lessen movement as much as may be, and for this, in order to obtain the best effect, the pedals should be horizontal or at the "quarter to three," the correct free-wheeling position. Rapid exposures are not needed; a 25th of a second at *f*.8 on a bright day with fast plates will be found to give a good negative. There is no reason

why this plan should not be applied to male customers as well, for many persons of both sexes lend themselves when cycling to most graceful and pleasing poses.

* * *

Gaslight Enlarging. The trade enlarger, whose work lies not only in the enlarging of negatives of reasonably decent quality such as he obtains from professional photographers, but also those of the quite unskilled amateur, has reason to ignore the advice which is sometimes given, namely, that the speed of modern bromide paper renders the use of a very high-power source of light unnecessary. It is quite true that the practice of some enlargers of keeping an oil lamp for the enlargement of particularly weak negatives on to bromide paper is one which contributes to a greatly improved result; but, on the other hand, a great deal more can be done if a high-power light such as an arc is available, and the enlargement made on one of the extra-slow gaslight papers, such as Cyko or New Kodura. The degree of brilliancy which in this way is obtained in an enlargement from an utterly miserable negative requires to be seen to be believed, and we have known of enlargers denying the making of such results except by the production of a new negative. The amateur enlarger can obtain them with his customary apparatus if he is prepared to let exposures run to as long as half an hour, but for commercial work a light of the power of an arc or mercury vapour is, of course, a necessity.

* * *

Quality of V.P.Negatives. Now that there is an ever-increasing tendency on the part of Press, commercial and professional photographers and serious amateurs towards the use of vest-pocket cameras, many are finding out that their technique is decidedly faulty. It is certainly easier for the less skilful to make technically perfect 12 by 10 negatives than to produce an equally good result from a vest-pocket size negative viâ enlarging. The ideal result depends mainly upon the worker knowing what kind of negative to aim for. The general tendency is to make these negatives too dense, and if this is the case, of course, the enlarging process will be found to make harsh contrasts all the harsher, and to lose the fine tonal qualities of the negative. It would be a good plan for the photographer who contemplates using a miniature camera as a supplementary instrument to make half a dozen exposures by the aid of the meter, taking care that these are on the full side and to develop them so that each is slightly further developed than the previous one. A set of enlargements from the negatives will show exactly what is required. Great care is needed to prevent mechanical damage, such as scratches, etc., and we favour the tank and time method of dealing with the exposures made with vest-pocket cameras. Grain must also be avoided, but with a suitable developer, used fairly diluted, this ought never to prove troublesome.

* * *

Transferred Bromides. Now that bromide paper is the almost universal printing medium with many photographers, more attention might with profit be given to the transfer variety, which, if carefully used, may be the means of imparting an individual and artistic expression to photographic work. We can recall a case recently in a large exhibition where considerable attention was attracted by a picture upon one of these papers which was transferred apparently to a brownish paper. The whole effect was most original and uncommon. The other day we noticed some cabinet-sized portraits upon quite large mounts in a certain photographer's show-case. Examination revealed the fact that they were originally made upon one of these papers and transferred to the mounting paper. A delicate tint was worked in round each print with water-colour, thus imparting a most delightful finish. This offers a considerable saving over the plan sometimes adopted of making the prints upon large sheets of paper and carefully masking off the picture, while the result is to all intents and purposes the same. That the picture is reversed by the transferring has never to our mind been a serious objection to the process, as the average sitter would quite fail to notice it, but if the operator's intention is to use the process in carrying out some definite scheme the plate may be put into the slide, glass side to the lens, and the slight difference allowed for when focussing. The back of the plate should be carefully cleaned, and the film protected from abrasion by the metal dividing plate of the slide. For this there is nothing better than a piece of card covered with black velvet cloth.

RATIONAL DEVELOPMENT.

There are many ideas as to what is the correct way of developing a negative, and the exponents of each claim that theirs is the true and only way. There is no accepted standard for goodness in a negative, which is perhaps a good thing, for its absence allows of individuality in the finished result, although this must not be confused with "fluking," which is what happens when an operator aims at one effect and obtains quite another, which he is astute enough to put forward as a premeditated piece of work. The clever photographer is the man who starts with a definite idea for a picture, and by skilled technique realises it in a print. To do this one must have perfect control of exposure and development. The best lighted figure may be made either hard or flat by incorrect exposure, while a correctly exposed plate may be made to yield a thin soft image or a dense harsh one by injudicious development.

To ensure even quality it is very necessary to keep to one brand, and preferably one grade of plate. The best technician in the world could not produce a dozen negatives of even quality from twelve plates of different makes and rapidities even if all had received an equivalent exposure. Plates vary greatly in the time taken for development and in the appearance of the image before fixing. A common way of judging the progress of development is to look for a trace of the image on the back of the plate. This can only be done if one brand of plate is in use, and then only to a limited extent, as this method is quite upset by variations in the thickness of the emulsion coating. While upon this subject it may be useful to correct an error sometimes made, which is, that when the image is clearly visible on the back of the film, the utmost density which the plate will give has been obtained. We had a case under our notice some few months ago where the operator proposed to change his plates, because, although he developed them right through to the back, the images were always thin. On our suggestion he allowed some plates to remain in the developer for three minutes longer than others, which he fixed at his usual time, and was convinced by the difference in density that his development had always been carried on for too short a time.

One of the old errors was that the best results could only be obtained by what was known as "tentative development." This meant starting the development with a minimum of alkali, which was gradually added as needed. There was some reason for this when ammonia was used as the alkali, as volatilisation rapidly reduced activity of the solution, and fresh ammonia was needed to complete development. When the fixed alkalies in the form of the carbonate of soda and potash came into general use the "working up" by adding small quantities of

alkali to the developer fell into disuse, although a few old-fashioned workers still practise it.

It is not our purpose to recommend any particular developing agent as superior to the others. Some developers have the reputation of giving thin images and others plucky ones, but this is largely a question of dilution and temperature. Next to exposure, which decides the possibilities of the negative, comes length of development with any given solution. With normal exposures short development gives a thin flat negative and long development gives the maximum of density and contrast. Between these extremes the operator must choose for himself. All non-staining developers, such as amidol, hydroquinone, and many others yield a negative of which the printing quality is due to reduced silver only, but pyro behaves differently, the silver image being reinforced by the "pyro stain." It is generally acknowledged that a pyro-developed negative will usually give a more brilliant print than one of apparently similar density, but free from stain. This is due to the fact that the stain is deposited in proportion to the density of the image, and is not uniform all over the plate. If such a negative be dissolved away, by using Farmer's reducer, it will be found that a thin brownish-yellow image remains.

One of the commonest errors in development is to over-develop under-exposed plates, and to under-develop over-exposed ones. This is caused in the first place by the desire to force out all possible detail in the shadows, the result being that the high lights are made so dense that any shadow detail is lost in the necessary depth of printing. In the second case the over-exposed plate is under-developed because the whole surface of the film quickly blackens, and the operator fears that the detail will become buried. This is quite wrong; the proper course is to develop for the full normal time, and to dissolve away the fog with the ferri-cyanide reducer. It may be noted here that it is of little or no avail to add bromide to the developer after the image is well out; to be effective, bromide should be added to the developer before pouring on the plate.

The degree of dilution of the developer has an important effect upon the negative. A weak solution can be used until all the details of an under-exposed plate are brought out, without obtaining too much intensity in the high-lights. Concentrated solutions give the maximum of contrast, especially when a little bromide is used in addition.

Too prolonged development will give a general chemical fog, and an excess of alkali often added in cases of under-exposure has the same effect. A disagreeable colour, not quite a fog, is caused by putting plates developed with amidol or metol direct into the fixing bath without rinsing. With pyro the fixing bath rapidly becomes discoloured, but with the non-stain developers a large quantity of solution can be carried over into the fixing bath without altering the colour very much.

AN EASY METHOD OF SILVERING MIRRORS.

Mirror silvering is an operation which is avoided by most photographers as a process in which the successes are few and for the favoured. After several failures with the tartaric acid-sugar reducing agent for silvering glass, the present writer cast about him for some simpler and more rough and ready method of preparing a reflector for his camera. It has long been known that it is possible to produce silver mirrors by the use of formaline as a reducer. The method, however, has not come into practical use because the deposit of silver is usually so granular that it will rub off the glass upon the least touch. The following formulæ provide a means of silvering glass and other substances with ease and rapidity, and the process is a fascinating one to watch.

STOCK SOLUTIONS.

Stock Silver.

Silver nitrate	45 grs.	3 gms.
Distilled water	10 ozs.	300 c.c.s.

Stock Formalin.

Formalin (40 p.c. Formaldehyde).	1 oz.	45 gms.
Distilled water	10 ozs.	450 c.c.s.
Methyl Violet dye	10 grs.	1 gm.

These solutions improve on keeping.

The following quantities are sufficient for 20 square inches of glass, allowing for waste silver being deposited on the dish and elsewhere.

Take 3 ozs. (90 c.c.s.) of the stock silver solution and add 10 per cent. ammonia solution drop by drop (a fountain pen filler is handy for this), shaking the mixture after each addition. The mixture first becomes turbid, and then gradually clears. When clear, stop adding ammonia. A slight excess of ammonia is not detrimental. In another receptacle pour out 3 drachms (11 c.c.s.) of the stock formalin solution.

The Silvering Process.

Take the piece of glass it is intended to silver, and clean it well with whiting and water, or by any other method that may be favoured, and rinse it under the tap, swabbing the surfaces with cotton wool. Now rub the wet face of the glass with another piece of cotton wool which has been soaked in the following *priming solution*:—

Tin Protochloride (Stannous Chloride)	25 grs.	1 gm.
Water	10 ozs.	200 c.c.s.

Ordinary tap water will do. This solution should be thrown away when done with.

Rinse the glass under the tap and wipe it with a piece of cotton wool which has been dipped in distilled water.

Place the glass face up in a developing dish which has previously been cleaned with nitric acid and rinsed with distilled water.

The next operation is to add the formalin to the ammonio-silver mixture, and immediately pour into the dish, and to rock the dish well.

The silver begins to deposit at once on the primed surface, the solution becoming darker after a short time, and then slowly clearing. After from one to two minutes the solution reaches its maximum clearness, the by-products of the reaction forming into little granules. At this point run tap water into the dish and lift the mirror out and rinse it, finally swabbing with a soft piece of wet cotton wool.

Allow the mirror to drain for a minute or two, and remove any drops of water from the surface by lightly touching them with a piece of blotting paper. After half an hour or so the mirror should be quite dry and ready for burnishing.

Finishing the Mirror.

When dry, the mirror should have a brilliant surface, with a slight yellowish tarnish, which must be removed by polishing if the front of the mirror is to be used as a reflector.

For polishing and burnishing the surface, take a piece of wash-leather a couple of inches square, or, failing this, a

piece of really soft cotton rag, and tie it round a plug of cotton wool, so as to form a medium soft pad. Keep this in an old plate-box with some rouge. The rouge may be bought at a chemist's, or in some households purloined from the feminine dressing-table. Jeweller's rouge is sometimes too coarse. The wash-leather pad should be lightly charged with the rouge.

Warm the mirror and the pad slightly so as to be sure that no moisture is present, and then lightly rub the surface with a rapid small circular motion. The mirror will take a brilliant polish and is then ready for use.

General Consideration.

Practically speaking, the hotter the glass before applying the silvering solution, the whiter and more granular the resulting mirror will be. Cold solutions produce quite a good deposit, which is dark in colour on the surface, but which takes a brilliant white polish. The best temperature is about 70° to 80° F. It is a good plan to have the glass a few degrees warmer than the solutions. This can be accomplished by immersing the glass in tepid distilled water for a few moments before silvering.

Celluloid may be easily silvered by exactly following the procedure as for glass.

Mirrors may be silvered face down if desired. It is a question more of convenience than actual merit.

Silver may be prevented from depositing on unwanted parts by painting those portions with vaseline or celluloid varnish previous to priming with the tin solution.

Spent solutions are hardly worth saving, even when there is a quantity. Most of the silver in the solution comes down as actual mirror surface.

Methyl violet dye has the property of keeping the surface of the mirror brilliant and unclouded. Its action is analogous to that of bromide in a developer. It may be omitted if not available.

The priming bath gives a much more adherent coating. It also has the property of attracting most of the silver to the working surface, instead of too generously distributing it on the sides and bottom of the dish. It is supposed that a silicate of tin is formed on the surface of the glass.* This, however, cannot be the case with celluloid or other non-glass surfaces.

The cost of silvering 20 square inches of glass, reckoning silver nitrate at 4s. per oz., is about 2½d. As failures cost as much as successes, it is a good plan to practise on small pieces of glass before attempting a larger surface. One has, for example, to learn how to clean glass properly.

Well boiled water can in most districts be used instead of distilled water.

As a protection against oxidation, the mirror may be varnished with celluloid varnish. The coating of varnish should not be too thin or it will dry with a smoky surface. No other varnish is suitable for the purpose, because silver reacts with most gums, etc. It is, however, easy to resilver a mirror when the surface is worn away by repeated repolishing that in most cases it is hardly worth while to decrease the efficiency of the reflecting surface by varnishing it.

Measures, beakers, and dishes should be cleaned after use with strong nitric acid, or the remnants of silver will give trouble when the vessels are used for other purposes.

JAMES GRAHAM.

* F. Fafet, *Jour. Soc. Chem. Ind.*, 1893, 151.

PRACTICUS IN THE STUDIO.

[Previous articles of this series, in which the aim of the writer is to communicate items of a long experience in studio portraiture, have appeared weekly since the beginning of the present year. It is not thought possible to continue the series to the length of that by the same writer which ran through the "British Journal" some years ago, but if any reader among the younger generation of photographers, and particularly those engaged as assistants, has a particular subject which might be dealt with, his or her suggestion will be welcomed. The subjects of the previous articles of the series have been as follows:—

A Talk About Lighting (Jan. 3).
The Camera and the Lens (Jan. 10).
Managing the Sitter (Jan. 24).
Backgrounds (Jan. 24).
Studio Exposures (Jan. 31).
Artificial Lighting (Feb. 7).
Printing Processes for Portraiture (Feb. 14).
Studio Accessories and Furniture (Feb. 21).
The Surroundings of the Studio (Feb. 28).
Studio Heating and Ventilation (March 7).
The Postcard Studio (March 14).
The Printing-Room (March 21).

ABOUT THE RECEPTION ROOM.

EXCEPT in the cheapest class of studio, where customers walk in and ask to be photographed in the same way as they would go into a haberdasher's for a packet of pins, the reception-room is one of the most important departments of the whole establishment. The photographer should never lose sight of the fact that he has not only to make photographs, but to sell them, and that the selling has to be done first. In nearly all business concerns the greatest importance is paid to the organisation of the selling department, and the principal salesmen or travellers are the most highly-paid members of the staff. It is so even in a few photographic businesses, for I know of one instance at least where the operator, a very efficient man, received £300 a year while the presiding genius of the reception-room made more than three times as much, while in others the lady receptionists are almost as highly paid as the operator. I do not give these examples to prove that a highly-paid receptionist is a necessity in every studio, but to point out the importance of this department in almost every class of business. As our Transatlantic friends would say, we are not in photography for our health, but to make as good a living as possible, and to this end we must put forward our wares in the most attractive way.

The reception-room should not have the appearance of an office or shop, but as nearly as possible resemble an ordinary room, where people should feel that they can inspect the specimens at their ease, without being hurried in their choice of size and style. I was recently in a reception-room nicely kept, but with hardly room to sit down, the greater part of the space being occupied by two huge roll-top desks, one for the receptionist and one for the proprietor. The selling was all done at a small table against one wall, and the floor space so restricted that if a second sitter came in, he or she and her

friends had almost to rub shoulders with the previous arrivals. This is embarrassing to both parties, as one's portrait is a private thing which is not to be discussed in public, the probable result being that a much smaller order was given in order to have the matter over and get out of the way. In contrast with this, I have seen a reception-room where the prospective sitter was interviewed in a secluded corner, while other visitors waited and looked at pictures in the main part of the room, plenty of comfortable seats being provided. Such an arrangement may not always be possible, but the idea is there, and it should be worked upon as far as conditions allow. In quite a small room a table and a couple of chairs can be arranged for the confidential talk, and all other seating accommodation placed at a judicious distance. Such seating accommodation, it may be hinted, should be kept clear for use, and not occupied by specimens and parcels.

A separate desk or table should be provided for bookkeeping, spotting, or any other work which the receptionist does to fill up her spare time, and, if possible, this should be screened off so that it cannot be inspected by prospective sitters. There is nothing so annoying as to have a friend call upon a sitter and tell her that she has seen her portraits in the course of finishing, adding a few gratuitous criticisms at the same time, while there are inquisitive folk who will not hesitate to quiz at business papers, which one may have the best reasons for keeping private. So lacking in manners are some folk that I have seen a man open a ledger to amuse himself while waiting.

An effort should be made to keep the room as fresh-looking as possible, and distemper or wall-papers should be renewed as soon as they become dingy. The studio is the workshop, and need not be so spick and span, but the reception-room gives the first impression, and that should be a good one. Hot colours should be avoided, cool greys and greens being usually suitable, and harmonising better with the work shown. Furniture should be as light in construction as is consistent with strength, and, above all, chairs and settees should be restful. It is not necessary that great expense be incurred in securing this, for a better effect can often be produced with cane or wicker and chintz than with carved oak and velvet. An effort should be made to show some individuality, and not to follow the beaten track too closely.

All specimens should be kept in good condition, and only up-to-date styles shown. In too many places the walls of the reception-room and staircases are cumbered with enlargements and paintings of the Victorian period, which waste space even if they do no other harm. I sometimes think that the success of some of the more recently established photographers is due to the fact that they exhibit no obsolete stuff. Regarding the loose specimens, these should be scrupulously clean and mounted in the current styles. Mounts change in fashion unless plain papers are used, and the modern public is quick to notice anything which is not quite up to date. All specimens should be kept in some sort of classification, so that it is not necessary to hunt through a heap of prints to find a certain style which may be desirable to bring forward. Specimens which are not often required are best kept in portfolios, carefully classified into such divisions as wedding groups, equestrian portraits, fancy dress pictures, and the like, and when various printing processes are used it is as well to have a set of the various kinds made from the same negative, so that a comparison may be more easily made. The outsider is more likely to be influenced by the subject, and will order from a bromide specimen of a subject which strikes her fancy instead of the more remunerative platinum or carbon.

Miniatures and coloured work should be carefully and appropriately framed, and the price quoted should include the frame. The photographer will then be spared the agony of seeing a delicate water colour on opal, framed in maroon plush, a shock which I have experienced.

The actual selling calls for the greatest tact. It is not sufficient to be attentive and keen on getting a good order; care must be taken not to wound the self-esteem of the prospective sitter. To avoid doing so, the receptionist should carefully abstain from bringing forward any styles which would not be suitable. Thus one should not offer full lengths to a dumpy sitter or profiles to one with a nez retroussé. In the first instance, should the sitter desire a full length, it should be pointed out that the face is then very small, and a three-quarter length suggested. This is much better than hinting that the lady has not the figure to make a full length. In the second case it may be pointed out that a profile, while making a good picture, is rarely a characteristic portrait. If in either case the request is persisted in, care should be taken that other positions are also taken and submitted, in which case the sitter will then discover for herself the fact which she would have resented being told point blank. Every effort should be made to secure a better order than the sitter originally contemplated, but this must be done skillfully and without any appearance of pushfulness. The superior appearance, the guaranteed permanence, or the fact that the picture shown is absolutely in the latest style should be pointed out, and in most cases the desired result will be obtained. The mere mention of the fact that some well-known person selected that style will sometimes do the needful. If the attempt should be unsuccessful, there should be no appearance of disappointment, but the order accepted with the same apparent cheerfulness as if it had been doubled. In many cases a promise of extra positions, with a hint that a re-sitting will be willingly given, will go far to induce the customer to take the better style, but in no case should there be any inference that any less pains will be taken with a small order than with a larger one.

A clever saleswoman—it is rarely a man nowadays—can greatly increase the turnover by the introduction of side lines, such as miniatures, enlargements, and copies. Few people have any idea of the excellent results which can be obtained from old portraits, and I have more than once obtained a good order, in addition to the sitter's own portraits, by showing a very successful enlargement from an apparently unpromising original, such as a faded C.D.V. or an amateur's snapshot. Hundreds of people have small pictures of friends who have fallen in the war, or who have died, without ever visiting a studio, which they would be glad to have reproduced in good style did they realise what was possible in this way. I have taken as much as thirty pounds for portraits of a schoolboy who had only once been photographed, and that in a group. Such work is usually ordered in platinotype or carbon on account of the absolute permanence which can be guaranteed. Many photographers who are not used to a high-class trade fall into the error of quoting too low a price for such work, but it is surprising what people will pay for a good picture of this kind. If it be beyond the power of the photographer to do so himself, he can entrust the work to a first-class trade house and still make a handsome profit. I can recall one case in which an order was taken for a thirty-guinea oil painting from a tiny head which someone had pasted inside his watch case. At least half of this was net profit to the photographer, whose part of the work consisted in making a careful copy and a plain enlargement as a guide for the artist.

I am afraid I have been rather discursive on this subject, but I am desirous of pointing out that the management of a railway ticket office and that of a photographer's reception-room need to be conducted upon different lines, although, perhaps, I am doing an injustice to the tourist agent, for I have seen a clever clerk persuade a would-be traveller to extend his tour by pointing out how much more he could see for only another ten pounds.

PRACTICUS.

SIDE-LINES FOR PROFESSIONAL PHOTOGRAPHERS.

Letters have recently been sent in to the "British Journal" containing inquiries as to suitable side-lines which can be worked in connection with photography. Perhaps a few hints from one who has made a study of this subject may be of use, especially to those who realise that this profession is not what it has been, owing to extreme competition, and the consequent degrading of prices. The best class man has nothing to fear. He will hold his own anywhere on the strength of his prestige, but the good middle-class man has a far wider field of rivalry to face, and a bigger army of competitors to fight with weapons easily equalled by theirs.

A profitable and attractive side-line, if selected with good taste, proves not only a help to the funds, but also serves as an appeal to a considerable number of prospective clients who would in the ordinary way have passed the studio by without a second glance. There is no reason why a side-line chosen with care and discrimination should impart a derogatory air to a photographic business, and where some of the highest and most exclusive have led the way, the rest need not hesitate to follow.

In the "Journal" mention was made of one instance in which a firm of Scottish photographers had taken up the designing and making of toys, and another in which a photographer in Kent specialised in the design and manufacture of fancy leather goods, such as calendars and blotters. Of course, such side-lines as these demand a good amount of talent and skill, which, unfortunately, belong only to the few. But others there are which come more within the scope of the less privileged, and amongst such may be mentioned the sale of art ware and pottery, which I have seen exploited by a photographer with success. The supply of picture and miniature frames forms so usual a side-line with photographers that they are only worth a passing allusion, as also are pictures and prints, engravings of worth and lithographic copies of many treasures of art.

One photographer has combined the sale of jewellery with his portraiture, and exhibits precious gems along with his other works of art, much to the general attraction of the showcase, and it may be safely asserted that no delicately wrought piece of jewellery or valuable stone is ever passed by unnoticed, at least by the gentler sex. It goes without saying that this branch of business demands the skilful judgment of an expert.

A lady photographer of my acquaintance, who in years gone by dabbled in art, is now contemplating the idea of introducing as a paying side-line the sale of hand-painted and poker-worked articles suitable as presents to take back by tourists and holiday-makers. She has seen it done elsewhere with astonishing success by a seaside photographer, who kept a table in the reception-room on which were displayed all sorts of hand-painted satin and velvet table-centres, pin-cushions, tidies, plaques, tobacco-jars, blotters, and so on, and amid floral sprays or dainty seascapes were painted the appropriate words, "A present from Saltbeach-by-the-Sea," etc. This "gift" table was kept supplied by members of the photographer's family, and so well was it patronised by trippers and others that even after they had finished their holiday and gone home they sometimes wrote back to order another cushion-cover or painted mat, so much had they been admired by their friends. All visitors to the seaside make a point of two things—to be photographed, and to take home a souvenir, and they would no more think of omitting either obligation than of going without the holiday. So why should not the photographer kill two birds with one stone?

Photography and stationery, photography and a doll's hospital, photography and a branch post office are all combinations I have met with, and although these side-lines might have very little to recommend themselves to professional photographers, they have, I believe, proved lucrative to those who carried them out. For my part, I think it unadvisable to introduce as side-lines anything that does not come under the title of art, as any photography worthy of the name is essentially art, whatever its critics may assert to the contrary, and to harness it to any less worthy branch would seem a breach of harmony. The side-line has a claim on our attention as an advertising agent, adding a novelty and interest to a shop window which otherwise might be lacking, if one is to judge by the mediocre displays of photographs which many of us must have noticed.

Other ideas occur to me on the subject of side-lines, but perhaps enough has now been said to suit the length of this article, and to start others on the track of suggestions which will be likely to prove a lucrative adjunct to a photographic business, and if such is the case my object will have been achieved.

E. M. Spiers.

SOFT EFFECTS IN ENLARGING.

[The facility and economy making portrait prints by enlargement are advantages of a system which is growing in favour, and which has a further claim to the notice of photographers—namely, the opportunity which it affords of producing a portrait of diffused definition from a negative of the ordinary character. This is a point which receives special emphasis in some notes on enlarging which we reprint below from "Camera Craft." Their author, Mr. J. Walter Doubleday, describes the particular form of device which he employs in breaking up to a pleasant degree the definition in the negative.—Eds. "B.J."]

Bromide enlarging is steadily growing in favour, even more rapidly than would be the case were only those workers taking it up who are changing from the formerly popular view camera sizes to the present more convenient small type of cameras. I know a number of professionals who are making all their portrait work through the enlarging lantern, not alone for the purpose of securing larger prints than the negatives they care to make, but for the control and speed that the process permits. They have, of course, somewhat modified their apparatus, by eliminating such parts as serve mainly to give a large range as to size, and by adding other fitments that increase rapidity of production.

I have mentioned this, not as an introduction to the subject of apparatus, which I shall avoid, but as a means of suggesting the recognised simplicity and advantage of making prints in this way. Enlarging apparatus is of such varied form, depending upon the light available, the requirements of the user, and to some extent the purse as well, that space does not permit me to do the subject justice if I am to record a few of the things I have learned about the actual production of bromide enlargements, things common to the work, irrespective of the form of apparatus used. Enlarging on bromide paper is quite simple, the apparatus required is not complicated, and the results have the highest endorsement of our best professionals and our leading exhibitors.

The negative best suited for enlarging is one that is soft, yet brilliant. But it must be brilliant. The kind of softness that results from full development of an over-exposed plate or film, softness combined with thickness, will not give a good enlargement. Slight fog or veiling of the image is also detrimental, and one must not assume that because such a negative will make a good contact print it should produce a good enlargement. This is a common mistake. The reason for the difference lies in the different action of the light. When the light is projected through such a negative in enlarging, there is a scattering of light from all portions of the silver deposit, and when there is even a slight deposit where it should not be, as in the case of fog or thickness, poor results must follow. In contact printing there is not this scattering of

light and not the same ill effect produced. One should strive for brilliancy with softness, and the use of a lens shade, particularly in the case of our rather short hooded and large aperture anastigmats, will do much in that direction. A safe dark-room light and a clean working developer will also help.

The strength of the light used in making the enlargements also has much to do with the quality of the negative best suited to the workers' requirements. Or rather, one can, by selecting a certain form of light, accommodate the process to negatives of quite different quality. The thin, fully exposed, yet under-developed negatives that some professionals affect, can be made to produce good enlargements only by using a rather weak light, such as an oil burner or gas jet produces. Strong, contrasty negatives require a strong light; and negatives carrying much retouching are best enlarged with well diffused daylight or a strong artificial light, like the arc, with ground glass between it and the condenser. The use of a soft-focus lens is also most advisable in such cases.

The truth of the matter is, the best plan is to find out, by experience, just what kind of negative is best suited to one's individual equipment, and then make negatives as near that standard as possible. It is quite obvious that only a worker with an extensive output to produce could equip himself with apparatus employing varying strengths of light as suggested above. A compromise, to some extent, can be effected by a judicious selection of different grades of paper offered; the range, since the introduction of the so-called chloride papers, with a speed somewhere between that of regular bromide and the gaslight papers, making this power of selection a valuable asset.

I suppose I should attempt to go into some detail on this latter point, but while the range is so wide, it is yet somewhat variable in different localities, and little would be achieved. At least, little compared to what the individual worker can best find out for himself by a very few experiments based upon the quality of the negative in hand and the maker's description of the various papers available in his case.

The exposure is the most troublesome factor of the entire process, but this has lost its terror to a great extent since the advent of developing papers. In the days of printing-out papers, with their visible image to serve as a guide, the correct timing of a bromide enlargement seemed to be much more of an achievement than was actually the case. The best plan, in my estimation, is to take each negative, as made, and give it a number that expresses something in the form of a ratio, something that will give an easily handled factor from which to figure the exposure in enlarging to any size. This can be done by making a correctly timed contact print on developing paper and noting the time, the time serving as the factor number. It is, of course, quite necessary that these factor numbers must all be determined under exactly the same conditions. A standard brand of paper must be used, one having little or no variation in speed, and the light and distance used in making the print must also be uniform.

If all one's negatives bear on their edge the number of seconds exposure required to produce a correctly timed print on, say, Regular Velox, exposed to a cluster of four thirty-two candlepower Mazda lamps at a distance of sixteen inches, little difficulty would be experienced in determining the correct exposure for any one of them for any size of enlargement, after a few experiments had been made. There would be a fixed relationship between these factor numbers and the number of seconds required for enlarging to different sizes, and the relationship could be easily determined by an experiment or two. One might find that the exposure required for a two-time enlargement, or enlargement to a certain commonly used size, was one and one-half times the exposure number established by the making of the contact print on developing paper. He then has but to read off the number on the margin of one of his negatives, multiply it by one and one-half, and he has the correct exposure for an enlargement of the designated size, providing that lens stop, strength of light, and grade of paper remain constant. If any of these are varied, proper allowance is easily made. A larger or smaller stop decreases or increases exposure in the same ratio as in regular work; the difference in the speed of the papers used is determined by experiment, and of course one's light is practically constant except where daylight is employed. In this latter case an actinometer can be used to determine the variation from the normal, if any. Practically all of the annuals carry a table giving the relative exposures for different degrees of enlargement, and I hardly need to occupy space with a repetition of one of them here.

Soft effects in enlargements are sometimes quite desirable, and we know of several firms that are making quite an enviable reputation on their bromide enlarging by using the less pronounced effect secured with the soft-focus lens employed for all their work. But all obtainable sharpness is often desirable, and we must be prepared to secure this last before we can regulate the amount of diffusion to our liking. Some workers find it very difficult to secure a satisfactory degree of sharpness, even from a negative that is undeniably sharp, and we will therefore take up a few of the possible causes for their difficulty. First, there is often an unsuspected lack of accordance between the chemical and the visual image projected by some lights, particularly the enclosed arc. Where this is the case, the variation must be determined by trial and allowance made for it in focussing. While the difference varies slightly with the size of enlargement, only the general difference need be considered and made up except where an unusually large stop is being employed. Where a condenser is used, failure to adjust the position of the light for different sizes of enlargement will also cause lack of sharpness. The light should be so placed that it is in the focus of the condenser for rays of light from the easel; in other words, the cone of light, after passing through the condensers, should come to a point small enough to pass through the stop of the lens. The distance of the light back of the condenser for different positions of the lens, which last means different sizes of enlargement, can be determined by focussing through a negative upon the easel for the desired size, then removing the negative and observing the distribution of the illumination as the position of the light is changed. Another frequently unsuspected cause of unsharpness is the use of the rising and falling, or the cross front, in bringing the image in the desired position on the easel. The centre of the lens, of the negative, the condensers and the light, should all be in a line and not out of centre with each other. It is also obvious that the lens carrying front of the camera or enlarging lantern must be in a plane parallel with that of the other elements, or this centring of the lens cannot be achieved. Dirt on the lens or vibration of some part of the apparatus during exposure is detrimental, and the bromide paper should lie perfectly flat against the easel so as to receive the image in the plane of critical sharpness.

Soft effects are, as I have said, frequently the most desirable, both for pictorial and other reasons. A hard, black mass with a sharp outline, is much more objectionable than one with a softer edging, as any landscape worker can testify, if he has given the matter any thought. In portraiture, the breaking up of all suggestion of hard lines is almost sure to result in improvement. With the soft-focus lenses some most pleasing results are secured, and it might be well to point out that different makes of these lenses give somewhat different results. The worker will, if buying a lens of this type, do well to try more than one and decide for himself which best suits his requirements. Bolting silk, stretched on a frame and interposed about three or four inches in front of the paper on the easel during all or a part of the exposure, is a quite common method of securing a breaking up of the image. The distance from the paper regulates the amount of breaking up achieved, and this distance again depends upon the distance of the paper from the lens. A more delicate softening is secured by using two thicknesses of chiffon to face a cap placed on the lens.

In my own practice the mount on the lens is fitted with a wire frame in which a movable slide is held close against the front hood. This slide is a piece of cigar-box wood about three times as long as it is wide, the width being sufficient to well cover the front of the lens. The centre of this slide is left solid, but a circular opening, large enough to permit free passage of light to the lens, is cut in each end. One of these openings is covered with two thicknesses of the chiffon material and the other with a piece of yellow glass, both let into the wood so as to be flush with the surface. With the centre of this slide in front of the lens, the cap is on; with the yellow screen in position, the paper on the easel is in safe light while being adjusted in position; and, with the chiffon section in

front of the lens, my soft enlargements are exposed. One could make the slide longer and include an unscreened opening, but in practice I found that lifting the slide out of the wire frame was less liable to shake the lens than trying to move it along in the proper position.

Even more important control of the results in enlarging can be secured by shading different portions of the image during exposure; or rather, during a portion of the exposure. A piece of cardboard, an old mount, preferably of a dark colour and roughly torn to the desired outline, serves as the shading medium and is to be interposed between the lens and the easel, or at least, some little distance from the paper. This should be kept in motion during the time it is being used, in order to further avoid a too sharp outline, the length of time it is interposed being proportioned to the entire exposure in accordance with the amount of holding back it is thought desirable. It is obvious that where the part to be held back comes fully within the boundaries of negative, this plan will not avail. One can then resort to a piece of the card torn roughly to the desired shape and fastened to the end of a piece of stout wire; an ordinary lady's hatpin answering admirably. Another plan is to attach the shading piece to the centre of a piece of glass and use this last as a support to enable it to be gently moved about so as to shade the part intended. Variations of these suggestions will suggest themselves to the worker and enable him quite rapidly to acquire the knack of exercising most beneficial control of nearly all his enlarging work. In fact, it will be found that practically every negative from which an enlargement is required is amenable to treatment of some kind along this line.

I might point out that availing oneself of these possibilities makes it advisable to increase somewhat the exposure time, and this last is best done by some other means than decreasing the size of the stop. The most practical method is to introduce one or more sheets of ground glass in front of the light employed. Using a slower paper may not give one just the effect desired—different speeds of paper printing differently, and decreasing the stop affects the illumination where a condenser is used and sometimes introduces granularity in other cases, even resulting in an enlarged image of the ground glass diffuser behind the negative being recorded upon the enlargement.

J. Walter Doubleday.

PHOTOGRAPHIC RAW PAPER BASE.

The prospectus of the new company, to bear the title Wiggins, Teape and Co. (1919), which is being formed from the previous well-known firm of paper-makers, Messrs. Wiggins, Teape and Co., Ltd., contains some particulars of the manufacture of raw paper base, which is perhaps the most important raw material employed by makers of photographic papers. It is stated that Messrs. Wiggins, Teape first seriously turned their attention to this branch of manufacture in 1911 when a series of experiments were carried out by the present works chemist at Buckland Mills, near Dover. These experiments were followed by others made at Chafford Mills, near Tunbridge Wells, and in 1914 the Glory Mills of the company at Wooburn Green, Bucks, were adapted to the manufacture of photographic paper base on a commercial scale. It is stated that during the war this plant has been extended from a capacity of 2 tons per week to one of over 20 tons per week, although the mill was at best only a makeshift, adopted during the war, and in many respects unsuitable for the manufacture of this special produce. The company, however, produced a photographic base paper which had been used for certain grades of photographic paper in large quantities with very satisfactory results.

It is now proposed, from the proceeds of the new issue of shares which are offered to the public, to erect a new mill for the manufacture of photographic raw base on land at Wooburn Green at an estimated cost of £300,000. The company estimate that before the war 5,000 tons per annum of photographic raw base were imported into this country from the Continent, chiefly from Germany. The new mill which is to be erected is designed to produce 50 tons per week, or approximately one-half the pre-war imported quantity. Room for further extension is, however, provided on the company's lands, and it is anticipated that makers of photographic papers will make use of this British product rather than resort to Continental supplies; and it is estimated that a profit of at least 2½d. per pound will be made, amounting to over £58,000 on the estimated output of 2,500 tons. Assuming this to be the case the profit to the company from the manufacture of photographic raw base will be not a very large amount below one-half of the whole profit of the concern. With this large stake in the manufacture of photographic raw base it may be believed that Messrs. Wiggins, Teape will devote the utmost of their experience in the manufacture of the product to maintaining a firm position in the supply of this essential material.

DEATH OF MR. G. WATMOUGH WEBSTER.

It is with very much regret that we announce the death on Saturday last, March 22, from influenza and bronchitis, of Mr. Watmough Webster, at the age of 76.

In his death there passes away one of the few remaining photographers of the old school, men whose practice began within a few years of the discovery of the wet-collodion process, and who lived in

The late G. Watmough Webster.

the days when fortunes in photography were quickly made, and when every new method, such as those which are now the public property of the craft, were jealously guarded by their inventors. Mr. Webster, in some reminiscences published in the "British Journal" not many years ago, recalled how for a long time the production of vignettes and the retouching of negatives were kept closely secret by their originators. Although in business as a photographer, Mr. Webster was his life long an experimenter, more particularly in the working methods which successively came into use. Moreover, he was a fluent writer, and the volumes of the "British Journal" up to within fifteen years ago contain scores of contributions over his name. The subjects of a few, cited at random—viz., studio building, copyright, print-washers, plate-backings, Röntgen rays, the persulphate reducer—show the keen interest which he took in the technical side of his craft.

For many years he was established as a photographer at Chester, where he took numerous photographs, some of which were widely published, of Mr. Gladstone and of visitors to Hawarden Castle. There is the story that Gladstone would give his permission for a certain portrait of himself to be taken only if copies could be placed on sale at a price not more than sixpence each. Though knowing the impossibility of complying with the condition, Mr. Webster

gned the agreement, which Gladstone wrote on a sheet of paper, fore he would consent to take his place before the camera. On being afterwards proved to him that the distributing trade could t handle the portraits at the stipulated price, the condition was ithdrawn. Mr. Webster's last connection with Gladstone was to ake photographic copies of his will, written on the pages of a enny memorandum book. Mr. Webster subsequently transferred imself as a photographer to the watering-place of West Kirby, on e Dee estuary, where he continued to be actively engaged in his usiness to within a few days of his death. An intimate friend of e first proprietor, Henry Greenwood, and the most notable editor, raill Taylor, of the "British Journal," Mr. Webster's connection ith this paper was of a more than ordinarily intimate character. o addition to such signed contributions as we have already mentioned, he was a regular contributor of notes and comments on topics f the hour under the pseudonym of "Free Lance." In the days hen Traill Taylor's successor, Mr. Bedding, indulged in a similar abit over the nom-de-plume of "Cosmos" there would often be a ively exchange of badinage, interesting chiefly to the two participants and to the inner circle of photographic personages, but more ften than not outside the experiences of the non-metropolitan hotographer.

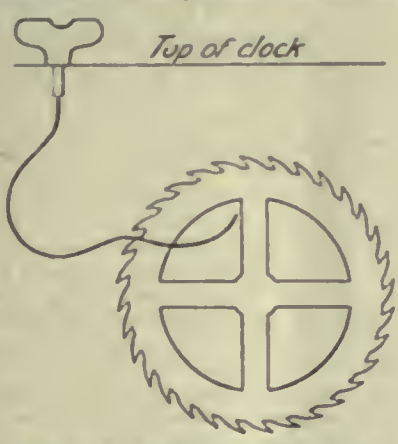
Assistants' Notes.

Notes by assistants suitable for this column will be considered nd paid for on the first of the month following publication.

How to Construct a Dark-Room Clock.

A clock to measure the seconds, the face and fingers of which an be plainly seen in the dark room, is a most desirable and useful thing. But one specially made for the purpose at the present time is rather an expensive item. The following instructions will enable any photographer to adapt an ordinary clock at very little cost. Any make or size will do, providing it has a good, bold, white dial and a minute finger, and is one without a pendulum, which will go in any position like a watch. Unless it has a minute finger it will be of no use for our purpose. It does not matter how old the movement is or how defective its time-keeping qualities; these are of no consequence. If we have not one in our possession one can be picked up very cheaply, often for a few pence at a clock repairer's or secondhand stores.

Having secured this, we can proceed with the work of convert



ing it into a dark-room clock. Carefully take the movement out of the case, noticing particularly how it is fixed in, and remove the fingers. Sometimes this latter has to be done before the movement will come out of the case. All screws, washers, fingers, etc., should be put into a saucer or small tray so that they will not get lost, as they will be required later. We should now carefully look at the works and notice just those wheels and spindles which are required to keep the clock going and the minute finger moving. All the rest of the movements are not required by us, and are better taken out. The best way to take these out without disturbing any other works is to cut through the spindles which carry the wheels with a three-cornered file anywhere where it is convenient. They can then easily be taken out. When all the unnecessary parts have been removed we shall have a clock which, when going, only takes round the minute hand. The dial should now be put back on the clock in such a manner that the centre of the dial where the hour hand was should be fixed over the minute finger movement. This may necessitate a little cutting of the dial, etc., or other parts, to allow it to fit in its right position, but can easily be accomplished. When this is fitted in position the long finger is carefully soldered on to the minute finger and blacked, the minute finger placed in position, and the whole movement put back into the case. We have now a clock which takes just one minute for the finger to go completely round the dial, and each of the hours five seconds. The dial being of a large size and white, and the finger black, it is very easy to see and count the time in the dark room. Of course, the clock will go with once winding as long as ever it did.

It will be seen from the above that there is no provision made for stopping the clock when once it has been wound up until it has run itself down, but it is quite easy to construct an arrangement by which it can be stopped and started at will. To do this it will be well to take a look at the drawing, where it will be seen that a hole is drilled through the top part of the clock, and a knob or turn button fitted in such a way, with washers between, as to carry a piece of bent steel wire that will just turn into the escapement wheel of the clock This wire should be sufficiently long that when it is turned towards the escapement wheel it will go right through and effectually lock it. When turned back it comes quite clear of it and releases the wheel. This is all worked with the knob at the top, which should not be too easy, but should move nicely. The clock is now complete, and can be wound up and stopped and started at will, and will prove as effective as the most expensive clock specially made for the purpose. That which has been adapted as described, has been in use for six years.—E. H.

Exhibitions.

PHOTOGRAPHS BY DR. ATKIN SWAN.

The Hampshire House Photographic Society is holding an exhibition of photographs by the President of the Royal Photographic Society, which many will no doubt be interested in visiting, not only out of a personal regard for Dr. Swan's breezy personality, but for the large measure of pictorial and technical quality which the pictures display. The subjects are for the most part presentations of scenes of travel. There are several delightful views of Venice, one of which shows the two well-known effigies of the Crusaders, and another a representation of the Colleone Statue, which competes with Fremiere's "Joan of Arc" in Paris for the honour of being the finest equestrian figure in the world. A study of the Court of the Lions, in the Alhambra, is another very fine example of Dr. Swan's always admirable technique, and possesses an arresting pictorial quality. But the greater number of the exhibits are Alpine subjects, in every instance of a very high order of technique, and affording a demonstration of the capabilities of the telephoto lens in the hands of a skilled craftsman. The exhibition is open at Hampshire House, Hog Lane, Hammersmith, daily from 2 o'clock to dusk until April 5.

FORTHCOMING EXHIBITIONS.

April 17 to May 22.—Hammersmith Hampshire House Photographic Society Annual Exhibition. Two open classes. Joint secretaries, J. G. Abrahams, 41, Hamilton Terrace, London, N.W.8; A. H. Page, 12, Lime Grove, London, W.12.

Mr. F. Gegg, of Evesham, is carrying out alterations in his studio establishment. The work is being done by Messrs. Espley, of Evesham, from the designs and under the superintendence of Mr. Drinkwater Butt, of 2, Margravine Studios, Baron's Court, London, W.6, whose architectural work for photographers is well known.

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Applications, March 10 to 15:—

PRINTING APPARATUS.—No. 6,395. Bromide printer. J. S. Baines and A. A. Pickering.

FILM.—No. 5,926. Photographic film and production thereof. E. S. Balchin.

CAMERAS.—No. 6,159. Lens-adjusting means for folding cameras. A. and R. S. Ballantine J. Lizars, and W. Watson.

CINEMATOGRAPHY.—No. 6,058. Cinematograph camera. A. Barnett.

CINEMATOGRAPHY.—No. 6,471. Shutters for cinematograph projection. W. Bottomley and S. W. Pilling.

CINEMATOGRAPHY.—No. 6,058. Cinematograph camera. E. Esdaile and A. Rose.

CINEMATOGRAPHY.—No. 6,150. Cinematograph machines. M. A. J. Harper and M. E. Myers.

STEREOSCOPIC PROJECTION.—No. 6,313. Means for obtaining stereoscopic effects in projected pictures. G. A. W. Hepburn.

CINEMATOGRAPHY.—No. 6,249. Cinematograph apparatus. T. N. Laws.

PROJECTION LANTERN AND SCREEN.—No. 6,419. Automatic magic lantern and screen. L. P. Linden.

CINEMATOGRAPHY.—No. 5,907. Cinematography. C. L. McDonnell.

WORK INDICATOR.—No. 6,381. Photographers' work indicator. G. F. Quilter.

COMPLETE SPECIFICATIONS ACCEPTED.

These specifications are obtainable, price 6d. each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

X-RAY DIRECTORS.—No. 122,780 (June 22, 1918). The director consists of a rod of wood or other suitable material attached to and detachable from any suitable part of the tube-holder, or of a cylinder, or other diaphragm used in combination with a tube-holder. Upon this rod slide two pointers, each pointer having at

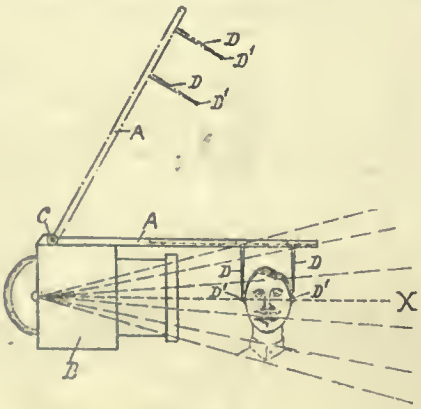


Fig. 1.

one end of it a suitable attachment, enabling it to slide backwards and forwards along the whole length of the rod. The rod is arranged in such a way as to enable it to be brought at will exactly parallel to the central beam or X-ray of normal incidence, and at such a distance from that ray as may be found most convenient. The other two ends of the pointers are so arranged as to be when at rest, and to continue to be when sliding along the rod, exactly in the path of the ray of normal incidence. These pointers may be of wood or of other suitable material, and, if made of wood or other material transparent to the rays, may have metal beads fixed in their free extremities to enable these extremities to be exactly centred with the diaphragm and target of the X-ray tube and to retain this centred position in their excursions along the rod. In Fig. 1 the essential feature of the device consists of the removable arm A pivoted or otherwise detachably connected at C to the X-ray tube box B or other tube carrier. On the arm A are mounted two sliding pointers D, which can be moved to any required distance apart along the arm A. The free extremities of the pointers D may be furnished with metal beads or tips D', so that if maintaining in position a radiographic record of the points of entry and exit of the central beam or X-ray of normal incidence, designated X on the drawings, will be obtained. As shown, the pointers D are applied in this instance one on either side of the head of the patient to be radiographed, and the tips D' coincide with and indicate the path of the central beam or X-ray of normal incidence.

In the alternative construction illustrated by Fig. 2 the director is shown mounted on a carrier attached to the cylindrical diaphragm E, instead of the tube box B. In this case the

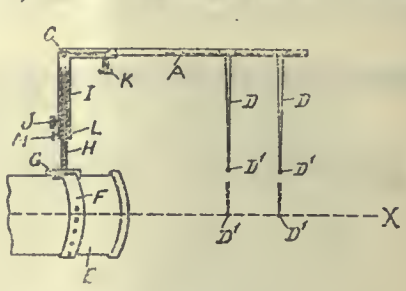


Fig. 2.

carrier consists of a metal band F, on which is mounted a sliding or adjustable plate or platform G, capable of being moved to any desired point round the circumference of the cylinder E, and there fixed or clamped in position by a pinching screw or equivalent not shown. The sliding platform G carries a rod or pillar H, upon which is fitted a sliding sleeve or socket I, fixed in position after adjustment by means of a pinching screw J or equivalent device. The arm A with the sliding pointers D, is pivoted or otherwise connected at C to the sleeve or socket I so that the arm can be raised out of the way when desired.

Between the sleeve or socket I and the platform G is a sliding collar L, which can be fixed at any position on the pillar H by a screw M. This collar is adjusted once for all in such a position that when the screw rests on its upper surface the free extremities D' of the pointers are in centre with the X-ray of normal incidence. Its purpose is to ensure that, after temporary detachment and replacement of the sleeve, rod, etc., the free extremities of the pointers shall again come into exact alignment with the X-ray of normal incidence.

Further, the angle of the arm A may be regulated for fine adjustment by the screw K.—George Goring Campion, 264, Oxford Road, Manchester.

DEVELOPING AND DRYING CINEMATOGRAPH FILMS.—No. 123,168 (February 15, 1918). The apparatus comprises a series of tanks, 1, 2, 3, and 4 of any desirable number which contain the solutions through which the film is to be passed for developing fixing, and washing, and includes also the wringer mechanism for removing the surplus moisture from the film surfaces before the entry of such film into the drying chamber 5, which is divided into compartments by means of hollow perforated partitions connected with a source of supply of air under pressure which is directed against the film for drying the latter preparatory to winding the same upon reels carried by the take-up mechanism.

The mechanism for driving the film through the liquids in the tanks, and through the drier, comprises horizontal shafts 7 disposed near the upper ends of the tanks inclusive, the shafts being journalled in bearings carried by parallel suspension rods 8 secured to the side rails 9 of a frame normally resting upon the upper edges of the side walls of the tanks and adapted to be raised and lowered for withdrawing the suspension rods and

parts carried thereby from the tanks. At their lower ends the suspension rods 6 carry the bearings for the shafts 10 extending parallel to shafts 7. The supports for the bearings of the shafts 7 and 10 also carry the bearings of the vertical shafts 11, each of which is equipped at its lower end with a bevel pinion meshing with a bevel pinion on each of the shafts 10. At their upper ends said shafts 11 carry bevel pinions meshing with bevel pinions on a horizontal shaft extending parallel with the side rails of the frame and journalled in bearings carried thereby. The shafts 7 are idle and each thereof carries a series of idle rolls 17 freely rotatable thereon and with respect to each other. Each of the rolls 17 is bordered by and alternated with discs 18 of larger diameter, the discs being rotatably mounted on the shafts 7 independently of the roller 17.

Each of the shafts 10, on the other hand, carries a series of rollers 19, which are rigid therewith, and are rotated by the shafts, the rollers being separated from each other by the flanges 20 corresponding to the discs 18. The number of rollers on each of the shafts 10 is one less than the number of idle rolls 17, and the rollers are relatively positioned so that the film is trained succes-

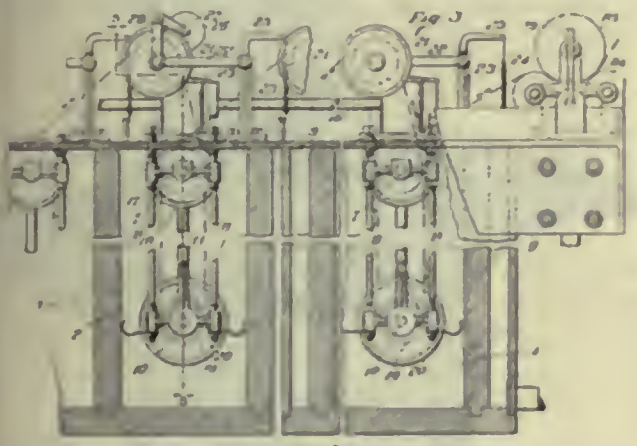


Fig. 1.

sively over an idle roll 17, thence over a roll 19, then over to the next succeeding roll 17, and the next succeeding roll 19, and so on from end to end of the shafts 7 and 10 in each tank or in each compartment of the drier. The film passes from a roller 17 in one tank over to a similar roller 17 at the top of the next succeeding tank, but in passing from one tank to the next it is trained over an idle roll 21 loosely mounted on a stud shaft carried at the outer end of an arm 22, which is pivotally mounted on a standard 23. Associated with each of the rolls 21 is a wringer roll 26, preferably covered with chamois skin, loosely mounted on a stud shaft at the end of a freely swinging arm 27, pivotally secured to a projection 28 of the arm 22, the purpose of the rolls 26 being to cause the free liquid carried by the film from each of the tanks through which it successively passes to flow back into the tank instead of being carried over to the next succeeding tank. Thus the carrying of a surplus amount of developing solution into a tank containing a fixing solution or carrying the latter into a tank containing wash water is prevented.

After the film has been passed successively through the solutions in the various tanks, it is trained over an idle roll, with which a wringer roll similar to the rolls 26 is associated, both being covered with chamois skin for causing excess liquid carried by the film to run back into the tank. It is then trained over a further series of rolls for removing free moisture from the film surfaces. It then passes through an opening in one end wall of the drying chamber 5.

The latter contains mechanism which, as shown in Fig. 2, is identical with the mechanism for effecting travel of the film through the several tanks, and comprising shafts 7 and 10 carrying the series of idle and fixed rolls respectively, all of the shafts 10 being, however, driven from a shaft 41 extending horizontally of the drying chamber. In order that the film, in passing through the several compartments of the drying chamber, may be amply subjected to the action of the air currents for drying the same, there are preferably interposed between the rolls on the shafts 7 and 10 series of idle rolls 42, 43 and 44, whereby the film in travel from a roll on the shaft 7 to a roll on the shaft 10, and *vice versâ*, is brought into close proximity to the perforated walls 45 of the hollow parts 46, by which the drying chamber is divided into

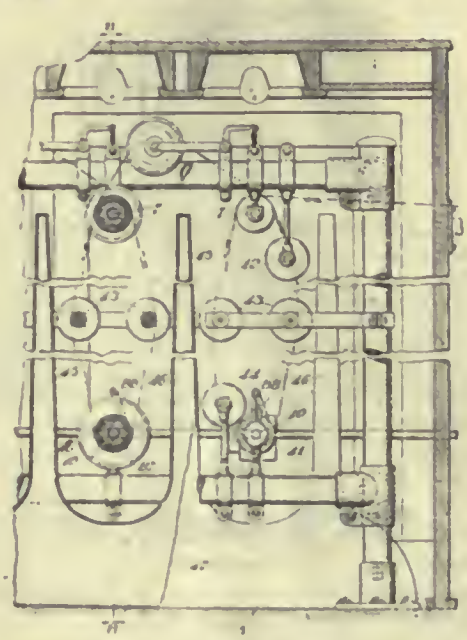
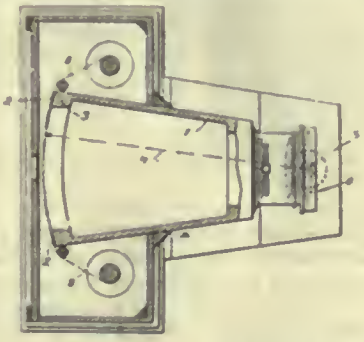


Fig. 2.

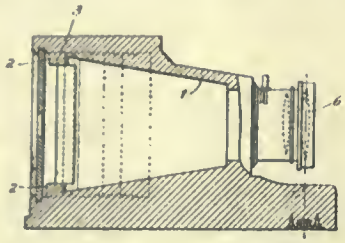
compartments. All the hollow spaces in the hollow partition walls 46 communicate with an air chamber 47, which is fed by means of a blower with air under light pressure, and which is preferably filtered, dried, warmed, or otherwise treated for effectually absorbing the moisture from the film during its travel through the drier. The drier really comprises a zig-zag flue (preferably fitted with doors not shown), into which air is continuously forced in one direction, and containing the film which is passed therethrough in a general direction opposite to the travel of the air. Frederick Benjamin Thompson, 1333 Argyle Street, Chicago, U.S.A.

Panoramic Cameras.—No. 119,032 (September 14, 1917). The invention refers to panoramic cameras having a constant radius of curvature of the sensitive surface in which, by a series of exposures, a panoramic picture extending over 360 degs. without overlapping portions is produced. In such cameras the objective was rotated about a vertical axis during the exposure. This requires complicated mechanism, and has the disadvantage that the picture loses in sharpness by the rotation of the objective. Where the light passes through slits to the objective, and from there to the sensitive surface, the strength of the light is considerably reduced.



The invention has for its object to avoid the above-mentioned disadvantages and to provide a simplification of the camera and the production of sharper pictures. This result is obtained by projecting the picture with the objective stationary on a stationary sensitive surface forming part of a cylinder.

In the drawings 1 is the body of the camera for taking panoramic pictures on film. The outer surface, 2, of the rear wall, 3, of the camera, 1, is curved to the radius of the focal distance, 4.



On this cylindrically curved surface lies the part of the film, 8, on which the particular picture of the series is being taken.

In taking each picture the objective, the centre of which is denoted by 5, as also the part of the film on the partly cylindrical surface, 2, of the camera, 1, remain at rest, so that a very sharp picture is taken. The complicated mechanism previously required for rotating the camera and feeding the film during the exposure are dispensed with, so that the panorama camera can be inexpensively produced. Nicola Stefani, Calprino, Tessin.

New Apparatus, &c.

The Ensign Printing Machine. Made by Houghtons, Limited, 88-89, High Holborn, London, W.C.1.

A PIECE of apparatus for the professional photographer just being introduced by Messrs Houghtons is deserving of prominent notice not only upon its merits, which are great, but from the fact that

it is the first new introduction in the way of photographic apparatus which has reached our table since the conclusion of hostilities. As shown in the illustrations the printer is designed to stand on the floor of the photographer's workroom, its top coming to the comfortable height of 31 inches. It is designed for taking negatives of all sizes from 15 by 12 inches. Those of the latter size are laid within the rebate which holds the plate-glass bed; carriers are provided for smaller sizes, the negatives being thus placed centrally in the machine. Lamps are not provided with the machine, so that the user can, in fitting them, please himself as to the power which he shall choose, and may thus reduce the length of exposure when employing the slower papers.

The apparatus is fitted with a sheet of ground glass immediately below the bed, and below that again a very convenient pattern of vignetter. This consists of a metal plate with a relatively large central aperture, pivoted around which are a number of thin metal plates with serrated edges. By bringing these plates into position—they are sufficiently stiffly mounted to stay where they are put—a vignetting aperture of any required size and of almost any shape in common use can be created in a few seconds. The vignetting plate is instantly removed from the apparatus when solid prints are to be made, and the same remark applies to the ground glass which the photographer may be glad to dispense with in the case of

negatives of exceptional density. The pressure board is made in two hinged portions and is operated by a handle which, if required, automatically locks itself in the position of pressure and thus relieves the user of the machine from the necessity of keeping down the handle himself. On the other hand if exposure is only of a second or two's duration the automatic latch is readily put out of action.

The whole apparatus is most solidly and substantially made and the practical convenience of the user is consulted by providing two hinged flaps on either side which usefully serve for holding supplies of paper and of exposed sheets or of keeping negatives at hand for use. The price of the machine, complete with carriers for negatives from 12 by 10 down to ¼-plate, ground-glass diffusing screen and vignetter, but not including the electric lamps, is £12 12s. 0d.

MESSRS. WELLINGTON AND WARD ask us to make mention of a packet which has reached them in one of their plate boxes containing a miniature of a lady and a postcard size negative of a family group. The address label has become detached, and it is hoped that the insertion of this notice may meet the eye of the owner, probably a miniature painter, who may obtain his property on communicating with Messrs. Wellington and Ward, at Elstree, Herts.

Analecta.

Extracts from our weekly and monthly contemporaries.

The Oil Transfer Process.

I would recommend (says H. Bertram Cox in the "Amateur Photographer and Photography" for March 26) for the first inking up a paper which, being expressly made for transfer, possesses extraordinary advantages. I was led to use it by a reference in Vol. 31 of the "Amateur Photographers' Library." It is called "Autotype litho transfer paper," and has a very glossy surface. It is therefore not very suitable for the ordinary oil process, but possesses peculiar advantages when transfer is the final result desired. It can be procured from the Autotype Company. The roll is best sawn through so as to make small rolls of the width required by the user. Lengths can then be readily cut off as and when required. A 5 per cent. bath of potassium bichromate, with or without the addition of a few drops of ammonia, should be employed. The sensitised sheet prints very quickly, and should be printed well out; the details in the highlights should be clearly distinguishable. When finished, the print should at once be cut to the size of the finished picture, leaving no margin, and plunged into tepid water. The temperature of the water is important. It should not exceed 75 degs. F., and 72 degs. is safer. The water should be changed every five minutes or so until the bichromate is completely washed out. When this has been accomplished, further soaking will, in most cases, be seen to be entirely unnecessary. The image will stand out in strong relief—the greater the exposure the stronger the relief—but it is unwise to press the exposure too far, or familiar difficulties may arise later in the course of inking up.

CATALOGUES AND TRADE NOTICES.

Messrs. J. H. Dallmeyer, Ltd., send us a list, just issued, of their cinematograph taking and projecting lenses, those of the former class including a telephoto series on the model of the Adon, in which the focal length is double the camera extension. The projecting lenses are made in focal lengths from 2 to 7 inches, and of aperture from f/2 to f/5.

Mr. Robert Ballantine, 99, St. Vincent Street, Glasgow, has just issued a 24-page list of high-class second-hand apparatus. It includes only goods of established reputation, such as Uns, Sibyl, and Vests hand cameras, Sanderson field cameras, Soho and Graflex reflexes, Ensign and Kodak film cameras, and lenses by the best makers. The list is sent on request.

Commercial & Legal Intelligence.

Legal Notices.—Charles Frederick Michell, photographer, 121, High Road, Balham, has been adjudicated bankrupt. The receiving order was made on the debtor's petition.

Notice is given of the dissolution of the partnership between William Edward Paradise and Elias Goldsmith, carrying on business as photographers at 2, Bute Place, Cardiff, under the style of Paradise and Goldsmith. All debts due to and owing by the late firm will be received and paid by William Edward Paradise.

Specialty Trade Work.—A frequent contributor to our pages, Mr. D. Charles, who has lately been demobilised from official photographic work in the Royal Engineers, has just started in business for himself at 365, Garratt Lane, London, S.W.18, as a maker of postcards and postcard enlargements from professional photographers' and amateurs' negatives, and in the production of other specialties of which we shall have something to say on another occasion. A special feature of postcards made by contact from photographers' negatives is the insertion of an attractive border and imprint which, as we see from a specimen sent to us, adds a very finished appearance to the card. Mr. Charles is also making a specialty of preparing copy negatives on thick, flat film, and offers his services in the production of line and panchromatic work of this kind to any special requirements. He is also a specialist in blocking-out, inserting backgrounds, and other "fake" work of any description. Knowing him to be an expert worker in the branches which he offers to undertake, we have no doubt that there are many photographers who will be anxious to avail themselves of his services.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Saturday, March 29.

Huddersfield Naturalist and Photographic Society. "Notes on Flat Fishes." F. W. Mills, F.L.S., F.R.M.S.

Monday, March 31.

South London Photographic Society. Portfolio Exhibition, arranged by W. E. White.

Tuesday, April 1.

Royal Photographic Society. "Commercial Photo-copying Processes." S. Bakeseff.
Chelsea Photographic Society. Dark Room.
Manchester Amateur Photographic Society. "Clouds in Prints and Slides." W. W. F. Pullen.

Wednesday, April 2.

Croydon Camera Club. "Home Portraiture." W. Foster Brigham.
Dennistoun Amateur Photographic Association. "Amateur Photographer" and "Photography" Prize Slides.
Edinburgh Photographic Society. "Architectural Photography." W. C. G. Collin.
Tunbridge Wells Amateur Photographic Association. "Tramps in Tyrol." G. W. Perkins.

Thursday, April 3.

Hackney Photographic Society. "Round the Mediterranean." Dr. C. Atkin-Swan.
Huddersfield Naturalist and Photographic Society. Lecturettes by C. Wood, J. H. Carter, W. H. Houghton, and F. Radcliffe.
Hammersmith (Hampshire House) Photographic Society. "A Backward Look."—Some Favourite Pictures Provided by Members. A. H. Liliett.
Birmingham Photographic Art Club. "Stories of Dartmoor." F. W. Pilditch.
Richmond Camera Club. "An Explanation of Some Photographs of Fire Brigade Work." S. G. Gamble.

ROYAL PHOTOGRAPHIC SOCIETY.

Meeting held Tuesday, March 25, Mr. E. W. Mellor in the chair.

Mr. R. H. Goodsall, late Lieut. R.A., delivered a lecture on "Egypt: Its Antiquities and People," illustrated by a large number of lantern slides. Mr. Goodsall showed his audience photographs of the ancient temples and tombs of Egypt, and had some theories of his own on the evolution of distinctive types of architecture. The later portion of his discourse on the places and people of modern Egypt was of equal interest.

On the proposition of the Chairman, the very hearty thanks of the meeting were accorded to the lecturer.

CROYDON CAMERA CLUB.

"But I cannot think of a subject," nervously expostulated Mr. J. Walker, when firmly commanded to make a first contribution to the syllabus, and knowing Mr. Walker, the title of last week's paper was instantly supplied, namely:—"The Defects and Imperfections of Photographic Apparatus and Materials," which, after brief cogitation, was accepted.

A popular member for many years he has been an acquisition to the club, a distinct personality giving him a niche of his own. In photographic pursuits he presents himself as a martyr to unfortunate coincidences. If not narrating actual experiences, by way of illustrative remarks, it may be said that if one out of many anastigmats has a bad bubble, that lens is sure to be sent him by the makers, and equally certain is it that the bubble will be right in the centre of the glass rendering f/64 inoperative. Mr. Walker never uses this stop, but this does not alleviate his harrowed feelings. Again, if perchance isolated defects occur whilst dry plates are being made, when cut to size all the damaged goods in some mysterious way will find themselves in one plate-box neatly addressed to "Walker, Croydon." This is resented and leads to a material increase in the receipts of the Inland Revenue through its postal department.

If troubles do not arise with normal frequency, things seem a bit dull and "unwalkerisk," so out he starts on a voyage of discovery. Whilst punting about the other day pining for fresh indignities, a veritable outrage was dropped upon by his unearthing a statement made by the manufacturers of an exposure-meter, to the effect that the sensitive meter-paper had considerable orthochromatic properties. Now, Mr. Walker uses a meter and often *ordinary* plates, and the fat was in the fire indeed, for if the meter-

paper indicates correctly for orthochromatic plates, what price the poor "ordinaries"! Left out in the blooming blue cold, so to speak. A brisk encounter between the indignant amateur and two concerns implicated followed.

As a matter of fact the point only arises in reference to evening light, text-books telling us that orthochromatic plates are relatively faster than ordinary plates to the mellow light of departing day, which is quite right and proper, as any suggestion to the contrary would perplex the student. Possibly some day someone competent to do so will make a few definite experiments to ascertain if any appreciable difference does exist in general landscape work under ordinary conditions. With an orthochromatic plate behind a filter obviously the horse is of another colour.

As to the lecturer's paper nothing but praise can be given; it dealt with a most varied assortment of cameras and accessories which had passed in long procession through his mechanical hands, and all about to camerise would not do better than consult Walker. A very useful member to have in a club. Most which he had to say was of real value, being based on experience and keen examination, but an epitome would be in the nature of a Hampton Court maze with an action for libel threatened at every wrong turning. On the other hand, when praise was due it was given, but good points are never so obtruding as bad. We also refrain from describing his ingenious specification for a perfect camera, including almost every movement and many novel adjustments, all compressed into a folding reflex, as the suggested "better 'ole" is in the region of Colney Hatch for camera designers.

An experience with a stereo-camera fitted with paired anastigmats and largely used with orthochromatic plates and two cap light-filters, deserves mention to emphasise one old point. The camera was received just prior to starting on a holiday on the Continent. On return, with his usual luck, in many cases the pictures on the left were found to be fuzzy, and those on the right dead sharp, whilst in others this state of affairs was reversed. The respective makers of camera and lenses then experienced an interesting time, the camera being suspected of variable parallelism, the lenses of being unhappily mated, but they failed to throw any light on the trouble, which was eventually traced by the lecturer to one of the light-filters acting as a weak supplementary lens, varying the focus of the objective on which it happened to be placed.

And so the account of "Walkerisms" went distressingly on until towards the end when the sun broke through the clouds, one envelope system of changing plates receiving his warmest recommendation having never been known to break down. In showing the working of a model a finishing touch was added to an altogether excellent evening by the apparatus sticking in the most obstinate fashion. "Deuce! if I know what is the matter with it," sadly said Mr. Walker.

South London Photographic Society.—At the last meeting Mr. N. F. Horne, F.R.P.S., delivered an interesting lecture on Practical Intensification and Reduction, which the lecturer described as the repairs department of photography, an essential department, in which the beginner had too much faith and the more experienced worker not sufficient. While admitting it is preferable to be able to produce a perfect negative as the result of each exposure, conditions sometimes militated against such perfection, and while after-treatment would make the best of a bad job, the worker must educate himself to recognise whether or no intensification or reduction was necessary just as soon as the negative leaves the fixing bath, as a negative at this period is better to work upon than one which has been allowed to dry. If, however, the negative is dried before either intensification or reduction the drying acts as a handicap.

A dried negative may show no signs of finger marks upon the film, but there is no evidence to prove that none exist; hence the film, for greater safety should be cleaned with benzine or petrol and then soaked in a weak solution of hydrochloric acid 1 in 60 for from 5 to 10 minutes; afterwards the negative should be subjected to prolonged soaking in plain water, not less than 30 minutes, while 3 hours would be better. Chromium intensifier is the most satisfactory, as greater or less intensification could be obtained by the varying the strength of the intensifier, moreover the whole operation can be carried out in weak daylight or artificial light. A stock solution of potass bichromate 1 oz., hydrochloric acid 80 mins., water 10 ozs. is quite a reliable one. For use, take one drm. of stock solution and add one oz. water; this provides the maximum intensification, and the operation can, if necessary, be repeated. For re-development a clean working developer such as amidol should be used, in fact the only developer not suitable is pyro.

Strange though it may seem, a stronger solution provides less intensification. The bleached negative must be washed until all the yellow stain is removed. If less intensification is required take 2 drms. of stock solution to 1 oz. water and add 5 mins. hydrochloric acid. For soft effects the bleached negative can be printed from without the subsequent re-development of the image, and good results obtained.

Tabloid mercuric iodide was recommended, but unfortunately, the lecturer remarked, it is not under control like chromium; nevertheless good results can be obtained provided care is taken to keep the dish on the move, and a good clean result will be ensured if the surface of the negative is carefully wiped after the intensification is completed. This intensifier increases the density in proportion. Uranium has one distinct advantage in that, should the intensified negative be unsatisfactory, the action of the intensifier can be removed by the application of weak ammonia, and the operation recommenced. A dry negative can be partially intensified, action only taking place in the shadows, or clear portions, before the high lights are touched: this is often a great advantage where under-exposure and over-development are concerned.

Unquestionably the most popular and useful reducer is ferricyanide and hypo. Rinse the former under the tap before use, and have everything ready to hand before mixing up the solution—the exact proportions are not a matter of great importance, but a clean and fresh solution of hypo is essential if stains are to be avoided.

For even reduction use a weak solution: local reduction can be carried out by the use of cotton wool plus reducer, but the cotton wool must not be kept in use for a long period, and it is always advisable to keep near the tap. In no circumstances should a negative be taken direct from the fixing bath and placed in the reducer, as a good wash is necessary to remove the dissolved silver from the negative. Another very useful method is to bleach the negative in a sulphide toning bleacher, wash for 20 minutes, and re-develop with amidol for a portion of the time usually given for the developer to have complete action.

This will strengthen the shadows and stop short in the high-lights. The negative should then be fixed in a clean hypo bath and washed.

Correspondence.

**** Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

**** We do not undertake responsibility for the opinions expressed by our correspondents.*

ARE MATERIALS PRICES TO FALL SOON?

To the Editors.

Gentlemen,—On page 54 of the "B.J.," dated January 31 last, you published a letter of mine forecasting an early reduction in the price of dry plates because of the withdrawing of certain Government contracts and the disappearance of certain names from the official list of contractors in the "Labour Gazette." In the following issue of the "B.J.," pages 62-3, Mr. Harry Hunt took me to task for airing such views, as also did the "Photographic Dealer."

Anyway I learn from the current issue of the "B.J." (page 149) that the price of dry plates were reduced on March 11, so that my prophecy has turned out to be correct.

I am now writing to ask you to tell my professional brethren to be of good cheer, for the current issue of the "Labour Gazette" has just arrived, and again the names of photographic manufacturers are conspicuous by their absence. We may, therefore, expect another reduction in price very soon. This, however, will be the last letter

that I shall send to you on the subject, as I do not wish to get into the habit of pointing out the accuracy of my forecasts.—Yours faithfully,

H. GREEN.

THE ASSISTANT QUESTION.

To the Editors.

Gentlemen,—As a photographer of some fifteen years' standing, and having just been demobilised after four and a-half years of Army life, I am much surprised to read the letter by "Simple Simon" in to-day's issue. Has the profession really fallen to such a degraded state as "S.S." says? Apparently there are no photographic artists left. All styling themselves as such must be either (a) a pure profiteer with no personal knowledge of his art, (b) a rogue and humbug, or (c) a pettifogger and producer of glorified cardboard. Has "S. S." never met the man (and there are many such) who really loves his work, and to whom the art of producing a portrait (in the full and true sense of the term) is a constant joy? The work of these men must on its own merits come to the fore and, from a commercial standpoint, "sell." These men will only employ the best assistants they can get, and will pay them the best wages in the same way that they invariably use and pay the price of the best material.

Poor "Simple Simon!" his knowledge of photographers is indeed limited, or perhaps his own special bits of glorified cardboard do not compare favourably with some of the West-End piffle, and the public as a whole is not a bad judge.—Yours very sincerely,

High Street, Eastleigh. FRANK CHIVERS.

THE EFFICIENCY OF THE FOCAL-PLANE SHUTTER.

To the Editors.

Gentlemen,—In the article of a fortnight ago about focal-plane shutters you gave extracts from Colonel Moessard, 1901, and also from the "Photo-Miniature," 1916. With regard to the former, you print a diagram in which he gives reasons for estimating efficiency on the ratio of E.G. to E.H. He says that the covering and uncovering of E.F. and G.H. are equal and opposite in order, and therefore can be reckoned as half the time. If we are to accept the usual definition for defining shutter efficiency, we can hardly cut off arbitrarily some of the time that is occupied in opening and closing, but, apart from that, this diagram is obviously and hopelessly wrong. There is only one way in which the plate could be illuminated as sketched, and that is by converting the lens from the refractor it is designed as into a circle of illuminated ground-glass, which it emphatically ought not to be.

The path of the rays from any point of light is "parallel" until the lens is reached, and then it converges to a point on the plate in the form of a cone, and the image is, after all, only made up of a number or aggregation of such points.

If you use a slit of ½ at a distance ⅓, the cone of rays that will just pass without eclipse will be obviously from a lens of $f/3$; reduce the aperture to $f/4.5$, and the diameter of the cone of rays will be reduced to ⅓, or $f/6$ to ¼, and $f/9$ to ⅙ of the slit width.

The second part of the article, from the "Photo-Miniature," grasps this point all right (though it does not appeal to me as being very clearly put), and really damns the previous diagram in the same contribution; though, curiously enough, here, too, they take the successive times of opening and closing, and then put them down as half their value. It may be all right, but in any shutter efficiency data with diaphragm shutters the opening and closing are always taken for their full time value, so why not focal-planes?

But, anyhow, that No. 1 diagram should never appear again in any connection with discussions of focal-plane efficiency.

CHAS. S. DYER.

Myrtle Cottage, Chase Road, Southgate, N.

[The writer of the article replies:—"Your correspondent is apparently led to dispute Moessard's representation by the fact that in the case of each of the four pencils of rays only one limiting line is shown. If your correspondent completes the diagram, he will see that it is identical with that from the 'Photo-Miniature.' The expression of two phase-periods of 50 per cent. efficiency as a single half-period of full efficiency seems to me a convenient method for obtaining the ratio of full to partial exposure."]

Answers to Correspondents.

SPECIAL NOTICE.

In consequence of general reduced supplies of paper, as the result of prohibition of the importation of much wood pulp and grass, a smaller space will be available until further notice for replies to correspondents.

Moreover, we will answer by post if stamped and addressed envelope is enclosed for reply: 5-cent. International Coupon, from readers abroad.

The full questions and answers will be printed only in the case of inquiries of general interest.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

J. W. PARKER.—If you mean wooden dishes, the best thing is to iron in paraffin wax.

M. GOLDSMID.—The Roland E. Green Manufacturing Company, Hastings, Mich., U.S.A. The price is $15.50.

A. F.—A quick retoucher could do six such heads per hour, but in most cases three or four per hour would be the average output.

A. S.—We do not know the makers of the lens you describe, but if it is in good condition and average quality it should be worth from 15s. to 25s.

J. P.—The lens is apparently a portrait combination, and probably of fair quality. It is of little value now, being worth perhaps from £2 to £2 10s.

INTERNATIONAL.—You can get a by-pass tap from any dealer in laboratory appliances, such as Messrs. Phillip Harris and Co., Edmund Street, Birmingham.

B. R.—A licence is still necessary. As mentioned in the "B.J." of March 21, you need to apply to the Secretary, New Business Licenses, 82, Westbourne Terrace, Paddington.

JAMES.—So far as we know the Hana printing machine, made by Messrs. Houghtons, is the only one in which a foot-treadle is used for the application of the pressure back.

J. S. A.— None on emulsion making which are not twenty years old and out of date. The best general book is "The Science and Practice of Photography," by Chapman Jones.

RED PAINT.—They are all very old lenses, and none of them would fetch more than a pound in the market. If you have use for them, we should say you had far better keep them.

H. C.—The dyes which we had in mind when replying to our correspondent are those sold by Mr. A. V. Godbold, 98, St. Asaph Road, Brockley, S.E., which we have reason to think are as permanent as any you can get.

E. F. C.—We do not give formulæ, as the preparation is so dangerous, and we advise you not to attempt. If you must, one of the best formulæ is to mix the magnesium powder with an equal weight of potassium nitrate.

CLACKCANNON.—No, professional men are not exempt. The best advice we can give you is to get hold of the clerk of the court and endeavour to get called as soon as possible. As we know to our cost, most of the delay is taken up by waiting to serve.

J. E. (Vancouver).—The only French photographic paper at present published is the "Photo-Revue," 118, Rue d'Assas, Paris, VI. If you mean portraits of stage celebrities, the largest firm of publishers here is the Rotary Photographic Company, West Drayton, Middlesex, who issue a very large series of postcard portraits.

SHANSI.—We should say the adhesive could be used with safety for developed prints, but it is usually slightly acid and ought not to be employed for P.O.P.'s. In any case, we cannot see any advantage in using it in preference to a good dextrine paste, which is just as adhesive and infinitely cleaner and more convenient in use.

DEVONSHIRE.—Soft washing water certainly makes a difference, and is probably the cause of the blisters. The prints should be passed through a hardening bath of formaline or alum before being toned, or it would probably answer as well to fix them in a fixing-hardening bath of hypo, alum, sulphite, and acid, made up according to the customary formula.

R. A.—The printing of silk sensitised by floating on a silver bath is usually done by attaching the silk with a touch of fish glue to a sheet of stiff paper so as to permit of examination during printing. The silk requires to be printed considerably beyond the depth required in the finished print, and is toned in a bath of gold, and acetate as formerly used with albumenised paper.

BRIENSIS.—There is very good ground for your customer's objection. Surely it should be generally known by this time that the customer has the right to prevent his or her portrait being exhibited in the photographer's showcase. The best thing you can do is to admit that the letter was written under a misapprehension, and remove the portraits as you are asked to do.

GRANDISON.—The prints have all the appearance of not having been properly fixed. As we have said many times, prints should be passed through two fixing baths in succession, renewing the first as soon as it is becoming exhausted. The best test for the activity of a fixing bath is to immerse a slip of dry-plate in it and notice the speed with which the white emulsion is dissolved away. If it takes longer than five minutes for the slip to clear, the fixing bath may be taken as exhausted for fixing prints.

A. M.—Albumen prepared from blood can be bought from any dealer in chemicals, such as Messrs. Johnsons, 23, Cross Street, Finsbury, E.C. It is still necessary to obtain a licence in order to start a new retail business of whatever kind. But we should say that it is now merely a matter of form, and you will have no difficulty in getting it from the branch of the Ministry of Labour which deals with the matter and has its address at 84, Westbourne Terrace, Paddington, W.2.

T S. L.—It is a mistake, but one which is found often repeated in photographic text-books. You had far better have the dark-room papered a light yellow or orange. If black scarcely any reflected light is diffused into the room, and it becomes very difficult to find anything which does not happen to be in a direct line with the dark-room lamp. The advice probably dates from the days when photographers were badly provided with glass for dark-room illumination; but with the present safelights there is no object whatever in having the walls a dark colour.

A. G. B.—Unless your builder is a skilled portrait photographer it is useless to listen to his ideas. There may be plenty of light, but if it is not in the right place you will not get good effects. Putting in the small skylight would only be a waste of money. So far as the appearance of the roof goes, it is for you to decide whether you prefer a pretty studio to good work. The object of widening the top light is to enable you to make up for the deficiency of side light by using it a more oblique angle. The studio we mentioned is in London, but we do not think the occupant, a lady, would care to show it.

F. S.—It is not so much a question of how many feet of glass is needed for the studio as the position it occupies. We should recommend four feet top and side at each end to be solid, the side light beginning at three and a-half feet from the floor up to the eaves; this will be twelve feet long. The roof should have glass halfway up the slope and be the same length as the side light. Good horticultural glass (sheet) will do very well, but if you want to prevent people looking through you should use rolled plate. This costs a little more, but it is stronger. It is much used for studio glazing.

G. W. K.—It is impossible, or, at any rate, very difficult, to get a good negative of a line subject on a rapid portrait plate. You should use a process or photo-mechanical plate, and develop preferably with hydroquinone. This will give you a negative with a very opaque ground and very nearly glass clearness in the lines. Very often there is an advantage in over-developing and then clearing the lines by going over the plate with Farmer's reducer applied on a tuft of cotton wool. This is better than immersing the plate in the reducer, as it removes superficial fog without the same degree of action on the general deposit.

A. S. H.—We cannot identify your old lens, but what you want is done very satisfactorily with a short-focus lens of large aperture, such as the Aldis photo-micrographic lens of 3-in. focal length; price (pre-war), £1 10s. 6d.; or with the *f*/6 Aldis of 4¼-in. focal length, similarly priced. With the former lens, assuming that you have a camera extension of 20 ins., you can enlarge to nearly six diameters. If you do not want to enlarge to such a large scale as this we should advise the 4¼-in. lens, on account of its greater covering power. Messrs. Houghtons or Messrs. Butcher supply double plate-holders, but it would be necessary to have an adapter made to fit into the existing groove of the Pressman reflex—that is to say, if you wish to use them alternately with the metal slides.

SHOP STUDIO.—I have a portable studio here, but should like to use shop, if possible, to do away with present studio. The one big drawback to this shop front is that the sun is on all the day, very strong in the summer. Do you think that by stippling the windows with white and the use of white and green casement curtains I could overcome this? Also, do you think the lighting arrangement would be satisfactory for busts, full-length figures, and small groups of three or four figures?—R. C.

We think you will be able to control the light in the way you suggest and get good results with single figures. You will have a little difficulty in getting groups evenly lighted, but you should be able to manage. If you have electric current a couple of half-watts would be a great help in giving a top and front light.

F. J.—1. We are afraid you will find a half-plate reflex too bulky and weighty a camera for outdoor work. Although more skill is needed in judging distances, you had much better choose one of the folding focal-plane cameras of the Goerz Anschutz type. 2. You have so much length in your studio that you can use a lens of almost any reasonable focal length. We think you had much better choose a 3B than a 2B Dallmeyer. It is the best all-round lens for studio portraiture, and practically as useful in 99 per cent. of the ordinary work as the 4B, which costs exactly double. For groups you cannot do better than get an anastigmat lens of about *f*/6 aperture. As we do not know what size of plate you intend to use of groups, it is impossible to advise you as to the focal length, but if you mention the size of the plate and the over-all width of the group in the studio any of the lens makers would tell you which is the requisite focal length.

The British Journal of Photography.

The Oldest Photographic Journal in the World.

PUBLISHED EVERY FRIDAY. ESTABLISHED 1854. **PRICE TWOPENCE**

TERMS OF SUBSCRIPTION, POST FREE.

UNITED KINGDOM.—One Year, 10s. 10d.; Six Months, 5s. 5d. Three Months, 2s. 9d.

CANADA ... ...
AUSTRALIA ... ...
NEW ZEALAND ... ...
SOUTH AFRICA ... ...
UNITED STATES OF AMERICA
SOUTH AMERICA ... ...
INDIA AND FAR EAST ... ...
CONTINENT OF EUROPE ...

One Year. Thirteen shillings (13s.), or 3 dollars 17 cents, or 16 francs 38 cents, or 9 rupees 12 annas, or 6 yens 30 sens.

FEDERATED MALAY STATES, BORNEO AND SARAWAK 5 dollars 57 cents.

HENRY GREENWOOD & CO., LTD., Proprietors and Publishers, 24, Wellington Street, London, W.C.2.

IMPORTANT NOTICE TO READERS.—Until further notice agents will supply the "B. J." to order only, as the high prices prevailing for everything in connection with newspaper production prohibit the distribution of surplus copies for chance sales. It is therefore necessary in order to ensure the regular delivery of the "B. J." each week to place an order definitely with a dealer, newsagent or bookstall clerk, or to send a subscription to the publishers.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3074. Vol. LXVI. FRIDAY, APRIL 4, 1919. Price Twopence.

Contents.

	Page
Ex-Cathedra	169
The Longevity of Photographic Prints in Relation to Record and Survey Work	170
A Bichromate-Mercury Intensifier. By D. Charles	172
Practices in the Studio. By Practicus	172
Training the Retoucher. By Geo F. Burrell	174
The Postcard Lantern as an Aid to Copying and Enlarging. By A. Lockett	174
Professional Photographers' Association	175
Patent News	177
New Books	177
Meetings of Societies	178
Commercial and Legal Intelligence	179
News and Notes	179
Correspondence—	
A Grid for the Dark-room Sink	179
Answers to Correspondents	180

SUMMARY.

Mr. D. Charles has originated a new intensifying process: one suitable for line negatives and giving very great density of deposit, with good clearness in the lines. The negative, bleached as for chromium intensification, is subsequently treated with mercuric iodide and with sulphide. (P. 172.)

In a leading article we deal with the qualities of photographic printing processes in reference to the preparation of prints which are to be preserved as records. It is pointed out that the fact of bromide or silver prints having lasted in good condition for a fair number of years is not a sufficient basis on which to recommend their use in the making of record collections. The platinum and carbon processes are, however, on a different footing in this respect. (P. 170.)

In this week's article "Practicus" deals with the equipment for home portraiture and with the considerations, as regards lighting, which require to govern the making of portraits in sitter's homes. (P. 172.)

In a contributed article Mr. George F. Burrell has some advice to give on the practice which is advisedly followed in the training of retouchers. (P. 174.)

At the annual general meeting Mr. H. A. St. George was elected president of the Professional Photographers' Association and a resolution carried to raise the annual subscription to ten shillings. (P. 175.)

A convenient form of dark-room sink is described by a Paris correspondent. (P. 175.)

Used for papers which it suits, the method of toning with "liver" of sulphur can provide a speedy and very effective substitute for the customary process of bleaching and sulphiding. (P. 169.)

Those who complain of lack of density in negatives on ultra rapid plates should revise their ideas of development. Thinness is invariably due to under-development—that is to say, for an insufficient time or with an improperly compounded developer. (P. 169.)

An imaginary obstacle to the use of the carbon process is veiling of the tissue from gas fumes, etc. While all possible exclusion of such fumes requires to be made when drying sensitised tissue, the dry tissue, such as can be bought ready sensitised, is remarkably unsusceptible to fog from this cause. (P. 170.)

"Colour Photography" Supplement.

A patent of Mr. Aron Hamburger's relates to a process for making a two-colour cinema film by simultaneously impressing the two monochrome images upon opposite sides of the film band. (P. 13.)

Details of the method of Mr. S. H. Williams by which Bromoil enlargements from a single three-colour banded negative are made are quoted from the "Journal of the Royal Photographic Society." (P. 15.)

EX CATHEDRA.

Liver Toning. There seems to be in some quarters a difficulty in getting satisfactory tones on bromide prints with the ordinary sulphide toning process. Instead of obtaining good rich sepia tones a rusty colour is got, due sometimes to a want of density in the negatives, or to over-exposure followed by insufficient development, while in other cases no modification in working will give the desired colour. To those who find themselves troubled in this way we recommend a trial of liver of sulphur (potassa sulphurata) as a toning agent. This has the advantage of giving a variety of colours, ranging from a warm black to sepia, including some very fine purple browns. One of its good points is an absence of the slight reducing tendency of the ferricyanide bleacher, and another is that even if the prints are inclined to be weak there is no liability to give a "ginger" colour. The process is a simple one; the toning bath consists only of sixty grains of "liver" to a pint of warm water, a few drops of ammonia being added when solution is complete. This should be raised to a temperature of about 100 deg. Fahr., and the print immersed until the desired colour is reached. A little allowance must be made for the further toning action, which goes on in the subsequent washing. Some papers will stand the heat of the solution without requiring hardening, but if there is any tendency to melt the prints should receive a preliminary bath of formalin, a convenient strength being two ounces to the pint. As with the hypo-alum bath, all papers will not tone to sepia in the liver of sulphur solution, some refusing to go beyond a purple black similar to P.O.P. A few trials with various papers will show the most suitable makes.

* * *

Rapid Plates and Density. It is commonly believed that it is difficult to obtain full density when using very rapid plates, and some operators prefer to use a slower grade in order to secure plucky negatives. The idea is fostered by the fact that the films of nearly all fast plates appear much more transparent before development than do those of slower ones, and this gives rise to the belief that such plates are thinly coated and lacking in silver. Such is certainly not the case, the fast plates having in some cases twice as much silver bromide spread over the square inch as the "ordinary" ones. We have used plates which were so transparent that ordinary printing could easily be read through the emulsion, but which gave almost perfect opacity when developed. The fact is that much longer development is necessary for a fast emulsion than for a slow one. If we take two plates of the same make, one an ordinary and the other a "super-sensitive," expose both correctly and develop in the same developer for the same length of time, the difference will

be most marked, but if the rapid plate be developed twice or even three times as long the densities will then be pretty even. Instead of prolonging the development the same effect may be produced by increasing the amount of alkali, or by raising the temperature of the developer. With regard to the former expedient, a little mishap which recently occurred to us will be instructive. By mistake carbonate of soda was used instead of sulphite in making a stock pyro solution, and by so doing the amount of alkali in the mixed developer was more than doubled. Upon developing for the usual time plates which normally gave thin delicate images became so dense that considerable reduction was necessary before the negatives were printable, a conclusive proof that a full quantity of silver was present.

* * *

Carbon Printing and Fumes. In some unaccountable way the notion has been created that carbon tissue is extremely sensitive to various fumes, and many have been deterred from using this charming process because they thought that special precautions had to be taken to avoid "tinting," or what would be called "fog" in other processes. We have recently seen excellent carbon prints, which were produced day after day under conditions which are popularly believed to be impossible. They were made in a work-room in which an evil-smelling dry-mounting press was used almost constantly; by the side of the sink a geyser was used to supply the hot water needed, and three feet away the sulphiding of bromide prints was constantly done. The reason for the immunity from the ill effects of this combination was a simple one; only ready-sensitised tissue was used. In a dry state the fumes had practically no effect upon it, and the short time it was exposed while wet during the mounting did not allow any action either. The great stumbling-block in carbon work is the drying when home-sensitised tissue is used, and practically all risk of "tint" may be avoided by drying the tissue in an air-tight box or cupboard over chloride of calcium. By so doing, not only is the atmosphere excluded, but the drying is done in the same time whatever the hygroscopic conditions may be outside. Another advantage gained by this method of drying is that the tissue is of uniform sensitiveness, which is not the case when it is dried in the open.

* * *

Semper Paratus. There is an old joke which is sometimes trotted out when anything uncommon presents itself "that you always see these things when you have not got your gun." If for gun we substitute camera we are recording the experience of nearly every photographer. Most of us can recall many occasions when we have seen effects of light and shade, or occurrences, which are not likely to be repeated, and have been compelled to leave them unrecorded because our camera was out of reach. We have known some photographers, mostly enthusiastic amateurs, who never went out without a camera, and at least one professional who did the same, and he told us that, on the whole, the practice had been a profitable one, besides being the means of securing many pictures of personal interest. This was in the days when the smallest camera was of the dimensions of a cigar box, and it required much more enthusiasm than in these times of pocket Kodaks and "baby" plate cameras. Apart from the constant carrying of a camera, it is an excellent plan to keep a small instrument, say, half-plate or less, ready filled with plates or films which can be picked up and used without a moment's delay. In this respect the amateur with his film outfit is usually much better prepared than his professional brother, who often has to assemble his outfit before it is ready for use. Perhaps the most convenient apparatus is of the folding focal-plane or "press" type, in which plates can be kept for weeks without danger of deterioration. Such a camera is of great value for sports, pictures, street scenes, and the like, while used with discretion it is very handy for home portraiture. The great point is that it should be *semper paratus*, always prepared.

* * *

For Print-Out Papers. The consistent reader of the photographic papers is constantly coming upon hints so ancient that, like the anecdotes of Miss Volumnia Deadlock, they have become in the cycles of time new again. At least forty years ago photographers who had need to make a very dense part of a negative impress its detail fully on the print would use for the purpose the concentrated light of a burning-glass. This old expedient must have been disinterred scores of times or, quite possibly, has been invented by those who have heralded it as a new device. Its latest appearance as something original is in a recent issue of a New York photographic paper. None the less, it is a plan which may often be employed with advantage in the case of negatives of interior subjects in which most probably windows or other brightly lighted parts have become too dense in the developer. In place of risking the negative by reducing or rubbing down the more opaque parts, an ordinary reading-glass of about three inches diameter may be held in front of the negative during printing and, while kept gently in motion, caused to concentrate its light upon the part which needs help. The American writer prefers to fit a disc of black card with a hole in it in the rim of the glass and so to obtain the utmost concentration of light.

THE LONGEVITY OF PHOTOGRAPHIC PRINTS IN RELATION TO RECORD AND SURVEY WORK.

A RECENT dictum of the Camera Club indirectly revives the question of the permanence of different printing processes to be used as records by photographic survey and record societies. Perhaps the most widely understood meaning of the word "permanent," applied to everyday things, appertains to unalterability, but in photographic circles when questions arise as to the relative permanence of different printing processes their respective "durability" is generally meant and is so understood. Degrees of unalterability is rather a contradiction in terms, whilst durability may widely vary. To put the matter bluntly, if any printing process will afford lasting results for, say, a dozen or so years and upwards, it is generally considered to be permanent in the restricted sense alluded to. But the matter is on another footing when photographs are to serve as records for posterity, for here it is not enough that they should last for fifty or even a hundred years, but a life is reasonably demanded limited only by the holding together of the picture supports. By general consensus of opinion two commercial printing processes only, or variants of them, fulfil this condition. The life of silver prints at the best is one of conjecture, which the lapse of time only can settle, and many are known to be more or less evanescent. In the case of photographs utilised purely as records their useful existence is longer than for most other purposes: if discoloured or partially faded, so long as all details are preserved, they serve their purpose. On the other hand, when once deterioration has begun it often proceeds apace.

Though all are agreed that complete fixation and thorough washing are essential elements in the stability of silver prints, yet it cannot be said that deterioration can only be ascribed to these operations being scamped,

and there may be operative causes which are quite unsuspected. Printers of the old albumenised paper have narrated how prints known to be hurriedly fixed and washed have sometimes long outlasted those which had received orthodox treatment. In past days albumenised prints appear to have been overwashed, as in addition to prolonged changes by hand they were frequently left to soak all night. Impure air, damp, impurities in the mount or mountant, or a mountant tending to turn acid or mouldy, are all known factors tending to alteration and fading. Even with one brand of paper puzzling differences in the durability of prints arise, one worker recording rapid fading, or other troubles, whilst another experiences just the opposite. Inquiries often fail to reveal any variation in procedure to account for such difference, which in some irrational way seems to be connected with the "personal equation" which looms largely in other directions.

In daylight silver-printing processes the image may be said to consist of something in the nature of a stain, whilst with bromide prints we have reduced silver in a fine state of division in gelatine, and the general opinion is that these are the most stable of all silver prints. The life of a dry-plate bears on the permanency of bromide prints, though we should expect the former to outlast the latter owing to the silver and gelatine being present in greater degree, and also to the fact that there is no paper to retain residual traces of hypo. Comparatively few old dry-plate negatives show unimpaired condition, but at Greenwich Royal Observatory there is no indication of fading in any dry-plate negatives of stars, although many date back more than twenty years. Doubtless scrupulous care was exercised in fixing and washing, and none have been intensified or even reduced.

Whilst nobody can place a limit on the life of a carefully made bromide print, which may last many a long year, yet the official pronouncement of the Camera Club that "a well-made, thoroughly fixed and washed bromide print is probably as permanent as a print in any other process" cannot be justified. The probabilities are against this conclusion, and at variance with the opinion of recognised authorities, and with the views of the great majority of photographers. In essence, the assertion is equivalent to saying that finely divided silver, vulnerable to many adverse influences, is as stable a substance as, say, lamp-black, or platinum black, both regarded as unalterable under every atmospheric condition, and respectively employed in the carbon and platinum processes. Having regard to the support and to the fact that the platinum image is in actual contact with the fibres of the paper, necessarily of the highest grade, a platinum print may present an advantage over a carbon when a long-distant future is concerned, but both can fairly be bracketed together as truly permanent photographic printing images. Neither, of course, exists commercially on the strength of this feature, but on the distinctive qualities associated with them. The extraordinary resisting properties of platinotype prints were illustrated some years ago, when a number remained at the bottom of the sea for some months in a sunken warship and were eventually salved none the worse for the adventure. Subsequently shown at the Brussels Exhibition, they perished by fire. Although the image of a carbon print is not in contact with the fibres of the paper, the pigment is locked in insoluble gelatine, known to be most durable in its normal state, and presumably more so when tanned by the action of light. As to the danger of peeling, sometimes alleged to exist, all that can be said is that this is of the rarest occurrence, and when it does take place may usually be traced to the under-soaking of the transfer paper, or over-hardening of the prints by chrome alum or similar chemical, or to undue haste in drying. Preference, naturally, will be given to those tissues which contain carbon pigment, however durable other pigments utilised may be.

If the opinion of those responsible for the recent utterance of the Camera Club is based on the undoubted fact that many bromide prints made years ago show not the slightest signs of alteration, this proves that the prints are long-lived, but affords no information as to their ultimate life. We have in our possession a framed silver print (apparently albumen) of French origin purchased over sixty years ago, made long prior to the introduction of bromide papers, and only during the last few years has it shown signs of deterioration, though continuously exposed to daylight, and occasionally hung on walls none too dry. Possibly in another twenty years or less the picture may have disappeared.

Granted that carbons and platinotypes are *the* processes for record work, which nearly all secretaries of photographic record societies fully recognise, yet the unfortunate fact remains that if these were insisted upon few prints would be received, as the majority of amateurs print in neither process. So such societies are practically forced to accept silver prints, and with no guarantee even that they have been thoroughly fixed and washed. Possibly a dry silver print hermetically sealed and kept in the dark might last almost indefinitely, but this is outside the region of practicability. However stored for access, it is impossible to prevent a limited circulation of air and of any impurities in it over the prints owing to barometrical changes. Dry-mounting on pure paper, and a coat of good varnish applied to the surface, should materially help towards longevity. In the case of subjects obviously valuable as records, the loan of the negatives might be sought to enable permanent prints to be obtained, but unfortunately funds are often not available for the purpose. We feel sure carbon or platinotype printing concerns would charge on the lowest possible basis, and on inquiry have received from two well-known firms an unofficial intimation to this effect.

There appears to be no specific authority conferred on any local authority to enable a small grant to be made for such a worthy object. But when the record society becomes part of the public free libraries (as in most cases should be the case for convenient reference) the general powers of expenditure are available. These are by no means great under the existing 1d. rate, which leaves but little margin for the purchase of necessary books, to say nothing of other desirable acquisitions. Many towns, however, have proposed an advance in the rate to 3d., and if this materialises prospects will be brighter for the societies associated with the libraries, if not for the ratepayer.

We wish all good-luck to the scheme of the Camera Club, and commend our observations to its attention, and in doing so a gentle reminder may be given to readers everywhere not to forget their local survey and record in the approaching season. Upon the executive, as a rule, falls the major part of the work, cheerfully undertaken and with no hope of being personally thanked by posterity, but we would urge a large measure of contribution by the general body of photographers.

Record Photographs of London.—The writer of "Under the Clock" in the *Daily News* hopes that photographers taking part in the Camera Club scheme "will refuse to confine their energies merely to recording street scenes. A flashlight snapshot of an elderly gentleman making his sixth attempt to board the Tube at Piccadilly Circus, or a sympathetic study in carbon of a newly married couple recuperating at the seaside after a week of house-hunting, would be no less appreciated by the historian. The nervous tension of the City could perhaps be broadly suggested by an artistic rendering in gum-bichromate of Mr. J. H. Thomas's smile on being told by his aerial chauffeur, at 10,000 ft. over the North Sea, that he had decided to strike."

A BICHROMATE-MERCURY INTENSIFIER.

It was while working under active service conditions that the experiments leading to the discovery of a new method of intensifying negatives was made. Some very brilliant results were required in the way of transparencies, and the only plates in stock of the size wanted were very stale, and though labelled "Process," would not give even ordinary printing density. So the only thing to do was to make the best possible, and then clear and intensify as much as possible. Lead was tried, but owing to the lack of proper washing accommodation, bad water, and also to the strong colour it gives to the very slightest trace of veil in the whites, it did not answer in this case. After trying every method that I could to persuade the "quarter-bloke" in charge of the stores to let me have the material without the usual circumlocution, and still not getting enough density, I began to experiment, and eventually found a method of greatly increasing the density without risk of stain provided that the negative was thoroughly fixed.

The procedure finally adopted was to bleach the negative in an acidified solution of potass bichromate (as for chromium intensification), and then, after washing for a short while, immersing in a mercury-iodide solution, and after a further wash to darken the bleached image in a sulphide bath; or else in a hydroquinone developer if there were any likelihood of subsequent reducing being called for.

I found that a lot of washing, after fixing the plate, between the various baths, was not essential to clean working, and the increase in density was far greater than I have been able to get with any other intensifier except lead. If the bichromate is not all out before the negative goes into the mercury bath, it comes out into that solution, but does not seem to affect its working.

Like the mercury-ammonia intensifier (which it easily beats for density-giving power) this new method can be worked without accurately weighed and measured solutions, but in that case it requires rather a lot of bottles. Being minus reference books or any accurate measures at the time referred to, I got on quite well without, and did not find any appreciable difference resulting from varying strengths and proportions of ingredients of solutions. The way I arranged matters was, first of all, to keep a saturated solution of potass bichromate, of which a little was diluted for use as required, and a few drops of hydrochloric acid added. If this did not bleach it was poured into a jar, and a few more drops of acid poured in. This bleaching bath does not keep, so it was thrown away after use. The mercury-iodide bath, on the other hand, keeps well in the dark-room, and can be used over and over again. As I had no formula by me, I made a fairly strong solution of each of mercury bichloride and potass iodide. Then a little of the latter was put aside, and into the remainder I poured the mercury solution a little at a time, well stirring and shaking to dissolve the red precipitate that forms when these two chemicals are mixed. A point is reached when a little of the red powder fails to re-dissolve, and it was to get this into solution that the small quantity of the potass iodide liquor was kept aside. On adding this to the bulk the precipitate disappeared. This strong solution was kept for stock, and was used diluted, but both the stock and working solutions appeared to keep well.

The sulphide solution was made as required from the crystal, but there is no reason why a stock solution should not also be employed for this. The used liquor should not be kept after the same day, as in the case of bromide toning. It seemed difficult to get the image thoroughly sulphided right through, so that if the density was too great some reduction was obtained by simply immersing the negative in a hypo bath. Another useful point with this intensifier, as in some others, is that if the plate before sulphiding is seen to be too dense or the lines are veiled, a dip in hypo solution will clear it. Of course, this means another good wash before sulphiding, and it should be pointed out that these extreme methods of working are seldom suitable for anything but line work, as the unevennesses of the emulsion are usually very much accentuated by employing strong measures.

D. CHARLES.

PRACTICUS IN THE STUDIO.

[Previous articles of this series, in which the aim of the writer is to communicate items of a long experience in studio portraiture, have appeared weekly since the beginning of the present year. It is not thought possible to continue the series to the length of that by the same writer which ran through the "British Journal" some years ago, but if any reader among the younger generation of photographers, and particularly those engaged as assistants, has a particular subject which might be dealt with, his or her suggestion will be welcomed. The subjects of the previous articles of the series have been as follows:—

A Talk About Lighting (Jan. 3).
The Camera and the Lens (Jan. 10).
Managing the Sitter (Jan. 17).
Backgrounds (Jan. 24).
Studio Exposures (Jan. 31).
Artificial Lighting (Feb. 7).
Printing Processes for Portraiture (Feb. 14).
Studio Accessories and Furniture (Feb. 21).
The Surroundings of the Studio (Feb. 28).
Studio Heating and Ventilation (March 7).
The Postcard Studio (March 14).
The Printing-Room (March 21).
About the Reception Room (March 28).

HOME PORTRAITURE.

WORK which comes frequently to some photographers and only at long intervals to others is that of taking portraits at the sitter's own home. Some firms specialise in it to the extent of sending operators long distances, poaching upon the territory of the local man. There is no more remunerative class of work than this if properly managed, and if the prints are of good quality, yet many photographers fight shy of it, and these, it is to be feared, are generally those who bungle the job. With regard to terms, these are largely governed by local conditions and the prices obtained at any particular studio, so that I will do no more than suggest that no additional fee be charged for "going out." One does not make a charge for going out to take a house, a horse, or a dog, and there is therefore no justification for making a charge if the model happens to be a human being. I recommend, however, that an order for a decent amount be secured, say, at least for a dozen of the highest class of cabinets, as a condition of the special visit. The fact that no additional charge is made will often induce a delicate or infirm person to be taken at once, instead of postponing the matter on account of the weather or other cause, with the possible result of the order being lost through death or the action

of a more enterprising artist. It is an excellent thing, from a business point of view, to secure the *entrée* to as many good houses as possible, for, with a little tact, it is easy to obtain orders for views of the home interior and exterior, and often of horses, dogs, and other domestic pets.

To make home portraiture easy and successful the outfit should be carefully chosen. The old way was to put the studio camera and stand in a cab and to trust to finding a dark-room in which to fill in the plates. This is not a fancy picture. Years ago I did it many times for a first-class firm, and I believe many do it still The latest idea is to use a reflex camera—which has its advantages—but, on the whole, I prefer a stand camera, which is not only more adaptable as regards rise, swings, and the use of different lenses, but impresses the sitters with the idea that the work is being done properly, and that they are not being "snapped" with a portable camera, like Cousin Jim uses. Personally, I prefer a light parallel-bellows camera for whole-plates, fitted with a 12 inch f/5.6 lens. I also carry a Dallmeyer 2B portrait lens, which is useful for children or in very badly lighted rooms. The shutter—a Packard Ideal or a Guerry double flap—is fixed inside the camera. Usually six slides are carried, filled with such sized plates as the order calls for. It is, however, a good plan to have a couple of whole-plates in one of the slides, in case there is not sufficient room to get in the desired amount of the figure, although the order may be for cabinets only. The 2B, however, will give a three-quarter figure in quite a small room. The stand is an ordinary three-fold tripod, but rather heavy, and provided with the folding wooden base so often described. This latter is a very useful addition, as not only are the feelings of the housewife relieved when she sees that it is not proposed to stick spikes into her rugs and carpets, but it permits of the camera being moved by sliding, instead of lifting, thus saving much time and labour.

Sometimes it is desirable to carry a small background, best a double-sided one of light and very dark grey, about 5 ft. by 4 ft., upon two light rollers; it does not weigh much and is easily carried. A piece of calico to serve as a reflector is also useful, but if more impedimenta are not objected to, one of the Kodak portable reflectors may be substituted with advantage.

Now we come to the most important part of the business—the placing and lighting of the sitter. In rooms which are lighted by only one window the choice of position is limited, unless the window is unusually large and high. With small windows it is necessary to place the sitter close to the window to ensure the light falling at the proper angle, which should be as nearly as possible the orthodox forty-five degrees. It is surprising how nearly studio lighting may be approximated to if this be done. One important preliminary is to cover the lower part of the light with opaque material, and if the outside light is very strong, the upper part should be covered with a translucent fabric, nainsook for choice. Butter muslin is sometimes used, but it is too open in texture for direct sunlight. In practice I find it convenient to sew the two pieces of stuff together, the upper half being a piece of nainsook about 4 ft. wide and 5 ft. to 6 ft. long, and the lower black or dark green sateen, the same width, and about 4 ft long; this allows for windows which go down to the floor. This curtain is easily fixed in position with three or four push pins, any surplus length at the top being closely folded or rolled and pinned through. In a dull light the white half may be folded down behind the dark part and the clear glass used.

As the conditions do not vary greatly in this class of work, the inexperienced photographer will do well to make a few exposures in an ordinary room at home and note upon the prints the positions in which the camera and sitter were placed to get the different effects; some will probably be good and more probably some will be bad, and, by selecting the more successful ones, he will find out the best way of working. For ordinary three-quarter lighting the sitter must be placed about 2 ft. back from the edge of the window and about 3 ft. into the room. This distance will vary with the height of the window; if the room be very lofty, the sitter may come further in and still be well lighted. Only in very lofty rooms should full lengths be attempted, otherwise the angle at which the light strikes the head is too small and the shadows of the features are flattened and the eyes filled with light. In some large houses, where the windows are 12 to 14 ft. in height, studio effects are easily got. For plain lighting the camera should be kept as near to the window side of the room as possible, but for other effects it may be placed in many other positions. The so-called Rembrandt lighting is easily got in an ordinary room, more easily than in most studios. In this style the wall at one-side of the window carries the background. Here the dark grey ground will be very useful; the sitter looks straight across the light, which should give a broad line of light down the profile. By turning the head, a little light may be allowed to fall on the cheek-bone, but this is a matter of taste. The shadow side of the face which is turned to the lens should be lighted up by the reflector, which must be near the camera; in fact, it is sometimes an advantage to cut a hole in the reflector for the lens to look through.

There are great possibilities in the use of an ordinary looking-glass, especially in small rooms, and when photographing invalids in bed, as by its aid the sitter may turn his face towards the window and still present the lighted side of it to the camera. In the very difficult case of a sitter in bed in a small room, the mirror may be so placed as to enable the photographer to work through the doorway. It should be remembered, as far as the working distance is concerned, that this is made up of the distance from sitter to mirror, plus the distance from lens to mirror, so that in a room where it is only possible to get 3 ft. between lens and sitter by the use of the mirror, the working distance may be double or more. It must not be forgotten that negatives so taken are laterally inverted—that is to say, that if printed in the ordinary way the hair will be parted on the wrong side; in fact, the image will be as seen in the mirror. To overcome this the prints may be made in single transfer carbon in Kodak transferotype bromide paper, or they may be printed in the enlarger with the glass side to the lens, or if portrait films be used, simply by printing from the back Some objections to the use of the mirror may be raised upon the ground that there is the possibility of getting a double outline of the image, and this, of course, would occur if the mirror and lens axis were at an angle of, say, 45 deg. with each other; but when the lens and mirror are at right angles to each other there is no danger of this defect appearing.

The scope of home portraiture may be greatly extended by the use of artificial light, and I look forward to the time when the nitrogen filled or half-watt lamps will have entirely displaced the ordinary vacuum (?) type. We shall then be able to work where we like in the room and get fireside and card-table groups as easily as in the studio. Meanwhile we must rely upon magnesium, either in the form of the flash, or, as I prefer to use it for this class of work, in ribbon. Two feet of ribbon cut into four lengths and twisted into a torch give a light equal to an arc-lamp, and, if burned behind a diffuser, leave nothing to be desired in the way of lighting. There is no explosion, as with the mixed powders; no snowstorm, as when the pure metal powder is used; the flame is small, and there is no risk to draperies, the only precaution necessary being the provision of an old tea tray or mat to catch any burning ash which may drop from the torch. I always carry a roll of magnesium ribbon in my camera case with a bit of sandpaper to brighten it with and a wooden clip to hold it while burning. Do not try to light oxidised ribbon; it is a slow job; brighten it with the sandpaper and then it lights quickly and burns evenly.

PRACTICUS.

TRAINING THE RETOUCHER.

The incompetence of a large proportion of retouchers is a fact which many photographers know too well. This deplorable state of things is chiefly due, I consider, to the sloppy methods of instructing that are in vogue in the profession. Much valuable time is wasted in having to inspect the work of such assistants before it goes to the next department, whereas it ought to be expected of them to be competent enough to pass it along through all departments until final inspection. I advocate the giving of a short allotted time and direct personal attention for a few days as a huge time-saver in the long run, and as an aid to high quality.

The majority of assistants do not know what retouching exactly should be. Generally speaking their knowledge does not go beyond the idea that they must aim at a decent stipple. What should be done, or what to do for the greatest improved effect with the least possible amount of labour, and how it affects the next department (*i.e.*, the enlarging and "finishing" artist) they lack knowledge of. In some cases masters lack knowledge of art principles and their application. Retouching taught without these, in my opinion, is absolutely valueless. Supposing the method usually adopted in training a pupil for retouching was applied in the darkroom or printing-room, disaster would sooner or later happen to a batch of work or soon tell its tale by the work not proving permanent. Naturally the first thing one does in these rooms is to explain the reasons for doing certain things.

Some sort of guidance in theory ought to be in vogue among all photographers—who have the profession at heart—beyond that of the mere making of money. The pupil wants a thorough knowledge of what is required in the branch he is being instructed in. One would not look at the end of a pencil to draw a straight line, otherwise there would be no means to the end in getting that line straight. The mind judges where that line should be to be straight and the brain directs the hand accordingly. It cannot be said that the hand directs the pencil to make the line straight; if the pencil is held correctly the mind draws the straight line. I take this principle as illustrative of my method of instruction for retouching. A negative cannot be retouched unless the whole effect required is in one's mind. How to hold the pencil is half the battle. I have noticed that retouchers who hold their pencils at right angles to the negatives and the forefinger tightly in the shape of a triangle are usually bad workers and their stipple is wormlike and has no symmetry. This is caused by their being unable in this manner to work the fingers freely, the guidance having to be done by the arm and wrist, making the arm an eccentric.

The correct style, and one which saves hours of labour for the finishing artist, is to hold the pencil very loosely between the thumb and first two fingers, and almost perpendicular, thus using the side of the pencil point and obtaining any desired angle of movement above the wrist by the fingers (the little finger resting on the negative). Never mind how you get a stipple so long as you work to follow the lines of the muscles of face and texture of the skin of the sitter, not to smother the negative. Many so-called expert retouchers (stipplers) place a beautiful sheen of lead all over the face, whether it be old man, lady, or child; in reality, a lead wash, such as a painter employs as a ground-tint. It is an absolute waste of time, and the effect mechanical, causing many a master to employ two retouchers where one would suffice, and giving an effect which is artistically and commercially valueless. Aim at altering defects only and improving the artistic value by the following course: Select your pupil and give half an hour's personal instruction each day for a week, first getting the pupil to master the taking away of complexion blotches and spots. Aim at nothing else until the pupil can do these to match the surrounding ground without overlapping.

The next step is to instruct where the muscles are exaggerated by the necessary side-lighting of the studio. With a satisfactory stroke there should be no so-called stipple. Then get your pupil to look at the whole of the face and imagine the negative as a line drawing in the positive sense, considering exactly what lines would be drawn to represent the character of the person (dismiss the half-tones for the moment). Get the pupil into the habit of bearing in mind the curve of the main lines that represent the character, such as the shape of the nose, main lines of lips and eyes. Any small complementary shadows there are to these do not need retouching. The next to consider is the relation of the strong highlights to the imaginary line drawing, and in doing this treat all the half-tone lights as that of a thin wash of paint an artist would put over his drawing. They need no altering, only blending into the main lines (i.e., massed shadows). The direct alteration of any half-tone or massed shadow representing the line of the facial muscle is fatal in retouching. These are the chief points to consider for artistic retouching. Any other work such as squaring noses and altering nose shadows are not necessary, if the face is properly lighted. All that is needed is the minimum work and the maximum result, which is only obtained by keeping the whole face in mind all the time. Try this method on your next pupil as against the old style of practice—practice without aim—and you will be surprised at the result and time saved.

GEO. F. BURRELL.

THE POSTCARD LANTERN AS AN AID TO COPYING AND ENLARGING.

A POSTCARD lantern or its equivalent, for a simple substitute is quite easily devised, will often prove of use to the photographer for special work. It may be of great assistance, for example, when one desires to make a copy or an enlarged negative from a print, while at the same time introducing modifications, or blocking out unwanted portions.

Direct enlarging with a postcard lantern is not new, having in fact been suggested by A. E. Swoyer, in the "American Annual of Photography" for 1914. That writer, however, regarded the projected image as an end, whereas in the present article it is simply a means to an end or intermediate stage, while the method adopted is entirely distinct.

It will be seen, by reference to fig. 1, that the postcard lantern consists of a body, A, in the front of which is fitted the objective, B, while at the back is a hinged door, C, with grooves to hold the print, or sometimes a sliding carrier. A good source of illumination is two 30 c.p. or 50 c.p. metal filament bulbs, D and E. The inside of the body is whitened, and it will be noted that the sides nearest the lamps are at such an angle as to reflect the light on the print. Two small interposed screens, or some similar arrangement, prevent direct rays reaching the lens. Cowled chimneys are usually fitted over the lamps, and due provision made for ventilation.

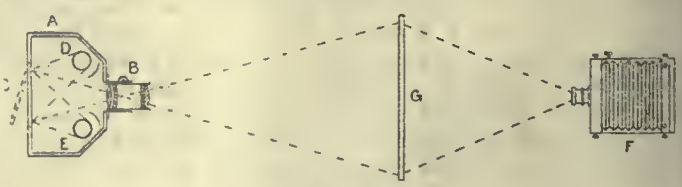


Fig. 1.

The most important item is the lens, which should be of fairly large aperture, owing to the loss of light by reflection, and should have a flat field. Cheap postcard lanterns often have objectives with so round a field that the holder has to be curved to get uniform definition. Such a lens is, of course, quite unsuitable for copying or enlarging. Many of these objectives are not even

achromatic, and, on the whole, a proper photographic lens is much to be preferred, even to the best of them. The lens must be capable of covering a plate at least as large as the print to be projected, and the lantern should have sufficient focal adjustment or extension to render a fairly small picture possible when required.

There will be needed, in addition to the lantern, an easel of the type shown in fig. 2. This consists of a frame, A, containing a

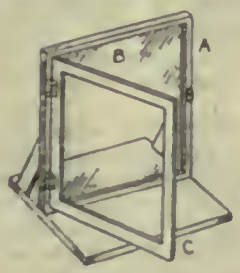


Fig. 2.

sheet of plain glass, B, and supported in a vertical position by a firm base and struts. To the frame, A, is hinged a smaller frame, C, which, when closed and secured by a turnbutton, presses on the glass.

The print to be copied is inserted at the back of the lantern, and focussed sharply to the desired size on a sheet of tracing paper stretched tant between the two frames on the easel; or, if preferred, a piece of finely-ground glass may be placed in the frame, A, instead of a plain piece, and the tracing paper dispensed with. If the second course is adopted, the ground side of the glass should be at the back of the easel.

The worker, standing or sitting behind the easel, now has it in his power to modify the projected image considerably, by means of pencil or stump work on the ground glass or tracing paper, and even the brush may be employed advantageously in some cases. Since the image is a positive, there is no difficulty in seeing exactly how the final result will appear. Care, of course, has to be taken that the work matches the colour of the image.

The next step is to make a negative from the modified image, by setting up a camera, F (fig. 1), behind, and central to the easel, G, without moving or interfering with the lantern. Thus, the copy negative will contain all the introduced work as well as the essential characteristics of the original, and the result, if all is well done, will be a considerable improvement. The negative may obviously be any required size, though preferably it should be smaller than the projected image, as this reduces the likelihood of grain showing.

It will be seen that this method affords a handy way of inserting a black background, by painting round the projected image with any suitable opaque; or of introducing accessories on an originally plain light background; copying joined-up prints and combinations; adding skies to landscapes; and many other purposes.

One may also make enlarged modified negatives direct from prints, by working-up the projected image, as before described, and then, having first covered the objective, placing a large plate in the frame behind the ground glass or tracing paper, the exposure being then given by uncovering the objective for an estimated time. In this case, the postcard lantern must evidently be light-trapped properly, which is not so necessary for copying with a camera; while a little extra space must be left in the rebate of the easel frame to allow the insertion of the plate. Enlarging in this way softens the definition a little, and thus lends itself to artistic effects. There may also be a slight grain, but with proper care this should not be objectionable. Backed plates should invariably be used.

Since metal-filament lamps do not give out much heat, it is quite feasible, with an intelligent study of size and ventilation, to construct a simple wooden lantern of the kind under discussion; or, with but a little adaptation, one or other of the various contrivances for enlarging by reflected light without a condenser may be pressed into service.

To anticipate a difficulty which may, perhaps, perplex some who are unfamiliar with postcard lanterns, it should be stated that the projected image is always laterally reversed. Viewed from the rear of the easel, however, there is no inversion, which explains why copying is done from the back, that also being fortunately the most convenient position.

A. Lockett.

PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

The New President.

At the annual general meeting of the Professional Photographers' Association, held on March 14 last, Mr. H. A. St. George was elected president for the ensuing year. Mr. St. George is a partner in the firm of Henry Dixon and Sons, of Albany Street, London, N.W., photographic copyists of paintings and other works of art. He has been a member of the council of the Association since 1912, and

H. A. St. George, Elected President Professional Photographers' Association March 14.

as one of the younger members of that body, and, moreover, as one whose business enables him to take a somewhat more detached view of conditions in portrait photography, it may be expected that the Association will benefit by his presence at its head in the discussion of problems which are likely to arise during the next few years. It may be hoped, too, that under his leadership some beneficial result may be reached in the way of forming a stable and influential group of commercial photographers within the P.P.A. as a means of protecting the interests of the increasing number of photographers in this branch.

Annual General Meeting.

The annual general meeting was held at the rooms of the Royal Photographic Society, 35, Russell Square, London, W.C., on Friday, March 14, 1919, the president, Mr. H. A. Llewellyn Chapman (Swansea) in the chair.

The minutes of the last general meeting having been read and confirmed, the president asked for nominations of scrutineers of the ballot papers. Messrs. Wedlake and Skillman were appointed. The ballot papers were thereupon handed to these gentlemen, who withdrew to carry out their work.

The hon. secretary read the annual report of the council (already published in the "B.J.," February 28 last).

The adoption of the report was moved and seconded by Messrs. Illingworth (Northampton) and Ellis (London). In a general discussion of the report which followed, Mr. Chapman (Swansea) congratulated the Association upon the accession of 151 new members during the year, and urged the claims of the Association upon the profession generally. He said that he would not be satisfied until every professional photographer worthy of the name had joined their body. He was only reiterating the advice of the "British Journal of Photography." A congress during his year of office had been impossible, but there were good grounds for anticipating one in 1920, and he hoped it would be well supported. A congress was essential to the professional. It helped everyone. It helped photographers who were able to attend, it encouraged those who could not attend, and made them wish to do so another year. It helped the trade. It made business. It broadened everyone's ideas and sympathies, and by bringing men together it helped to create that brotherly feeling which was advantageous to all, but especially to those who followed the art and craft of professional photography. He looked forward with great expectation to the time when he would be able to greet his brother artists at the next congress.

Mr. Hands (Wanstead) said that commercial photographers required the assistance of the Association principally in the direction of determining prices. He meant that advice was required in this class of business as to the proper charges which a photographer ought to make.

Mr. St. George (London) related the efforts which had been made to form a branch to deal more particularly with the business of commercial and technical photography. Their success had not been commensurate with their efforts, but he would endeavour during his year of office to encourage the members interested in that particular branch of the trade to come together to protect their own interests. The P.P.A. would help them to the utmost of its power.

Mr. R. N. Speaight (London) hoped that the matter could be dealt with in the Circular. It would be useful to many.

At this stage of the proceedings the President stated that, owing to the exigencies of the train service—he having to return to Swansea that evening—he would ask the indulgence of the members to alter the order of the business. He proposed at once to induct the president-elect into the chair. This would enable him to catch his last train. His year of office had been a very pleasant one; he had been shown the greatest courtesy, and he thanked the members very sincerely for the honour they had done him by electing him president.

With customary ceremonial the retiring president then inducted the newly-elected president into the chair, and placed the badge of office around his neck.

Mr. H. A. St. George then said that his predecessor, although living so far from London, has attended many meetings of the council, and has taken a keen interest in the proceedings and welfare of the Association. He himself would endeavour not to fall behind him in either sense. The war had come to an end, and they all hoped to have a new England, and incidentally an invigorated P.P.A. When his term of office expired, he hoped to leave the Association better and more prosperous than he had found it. There was plenty of work in sight. The increased prices of photographic materials had placed the conduct of photographic business upon a new footing. The status of photography must be maintained and improved. No one had foreseen the important part which photography would play in the war, the material help which it would give to the successful prosecution of the war. Great alterations were possible in photography, and the members of the Association could help these things to materialise. As president he would help with all his power; but he, or others in his place, could only do a small part—the bulk of the motive power must come from the members themselves. Members, more members, and still more members must be the motto. He hoped a congress would be held in 1920; let every member advertise it as widely as possible, and work for it to ensure success. He thanked the members for the confidence they had placed in him by electing him, and promised that what he could do he would do.

Mr. Ellis then moved, and Mr. Speaight seconded, and it was unanimously agreed, to accord a hearty vote of thanks to Mr. Chapman, the retiring president, for his services to the Association during his year of office.

Mr. Read (Southport) asked to be informed as to the number of members who were not master photographers; how many members were managers. There were great controversies now in progress about assistants. He thought it necessary to ask how many assistants were members (as managers) of the Association.

The Hon. Sec. thought that 95 per cent. of the members were master photographers.

The Hon. Treasurer then dealt with the statements of accounts. He hoped that members would think the figures satisfactory, and the arrangement of the figures clear. He had few comments to make. The number of subscriptions was the largest recorded. The expenditure had been carefully watched and no extravagances indulged in.

Mr. Rigden (London), the hon. auditor, discussed the form of the accounts, his principal criticism being directed to the manner of dealing with subscriptions paid in advance; and he made suggestions as to a better method. The Hon. Treasurer said that he had carried out the traditions as he had received them from his predecessors in office, and added that the Council would consider Mr. Rigden's suggestions, and decide how the accounts should be presented another year.

Mr. Ellis (London) then moved, and Mr. Illingworth (Northampton) seconded, and it was resolved unanimously that the statement of accounts, as printed, be adopted.

Messrs. Rigden (London) and G. W. Cooper (London) were appointed as honorary auditors for the ensuing year.

An alteration of Rule 5 was proposed by Mr. Read (Southport), and seconded by Mr. Cooper (London), to read as follows:—

> That the annual subscription be raised from 5s. to 10s., payable in advance.

Mr. Rigden moved as an amendment, which was seconded by Mr. Hana:—

> That in the case of members whose rateable value does not exceed £50, five shillings may be accepted.

The original motion was carried by a large majority.

Votes of thanks were accorded to Mr. Rigden for his services as hon. auditor, to Mr. Mackie for his work as hon. secretary, to Mr. Fry for his work as hon. treasurer, to the Council for their work for the Association

The Scrutineers (Messrs. Wedlake and Skillman) reported the result of the ballot as follows:—

PRESIDENT.

H. A. St. George (London).

PAST PRESIDENT.

H. A. Llewellyn Chapman

MEMBERS OF COUNCIL.

London.	*Country.*
Basil, A.	Adams, Marcus (Reading)
Chase, Gordon	Beaufort, J. W. (Birmingham)
Corbett, Alexander	Brown, F. (Leicester)
Dickinson, C. F.	Chaplin, W. B. (Windsor)
Ellis, Alfred	Chidley, Thos. (Chester)
Fry, S. H.	Cooper, Montague (Taunton)
Gray, W. E.	Illingworth, W. (Northampton)
Haines, Reginald	Lankester, P. (Tunbridge Wells)
Hana, George	Read, F. (Southport)
Sims, Lang	Spink, H. C. (Brighton)
Speaight, R. N.	Turner, T. C. (Hull)
Wakefield, F. W.	Watson, A. Swan (Edinburgh)

The work of the scrutineers having occupied the whole of the evening, a very hearty and exceedingly well-deserved vote of thanks was accorded them unanimously.

THE POPULAR ENLARGING COMPANY, of 41, High Street, Islington, London, N., in entering the ranks of firms making enlargements for photographers, recently asked us to inspect their premises and judge for ourselves the facilities of the firm for turning out their work with reasonable promptness. We found that the firm has put down a good and well arranged little plant, and judging from the specimens employed in its own portrait business, can offer very satisfactory service to photographers requiring the enlargements in general demand among middle-class studios.

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Applications, March 17 to 22:—

ROTARY PHOTOGRAVURE.—No. 6,602. Means for mounting photogravure cylinders. J. P. Bland.

DEVELOPING TANKS.—No. 6,971. Developing tank. F. Brodrick.

PHOTO-MICROGRAPHY.—No. 7,047. Photo-micrographic apparatus. S. W. Ross.

PROJECTION SCREENS.—No. 7,204. Cinematograph, etc., screens. M. Hurd.

CINEMATOGRAPHY.—No. 6,571 Rotating shutters of cinematograph projectors. A. Kur.

CINEMATOGRAPHY.—No. 7,026. Cinematography projectors. T. E. C. Wheeler.

LIGHT TRANSMISSION.—No. 7,041. Process for creating variations in relative, normal, refrangibility, or velocity ratio of light-transmission through or from differing refracting media. H. Soar.

COMPLETE SPECIFICATIONS ACCEPTED.

These specifications are obtainable, price 6d. each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

LANTERN SCREENS.—No. 121,499. (April 26, 1918.) A surface covering of finely divided particles of mica or quartz is given to the screen by employing a suitable size or medium, so that it may be applied by means of a brush; this greatly increases the quantity of light reflected from the portions illuminated without detracting from the effect of the shadows; it also reduces the amount of light required to illuminate the screen, adds depth and distance effect to the picture, and makes it possible to reproduce on the screen the brilliancy of natural sunshine and other lighting effects. Charles Frederick Kirby, Oakhurst, 57, Ashbourne Road, Derby.

LANTERN SCREENS.—No. 117,053. (March 14, 1918.) A silvered screen is veiled by two separate screens, with spaces between, these veiling screens being composed of netting silvered on the front. The construction of the screen is as follows: The back screen is composed of plaster or fabric or the like, silvered over on the front. Over this back screen is placed a veiling screen with a space between them; this veiling screen is composed of a fine mesh netting or the like, silvered over on the front side and black on the rear side. In front of this veiling screen is placed a second veiling screen with a space between them; this second veiling screen is composed of a fine mesh netting or the like, silvered over on the front side and black on the rearside. Frank Heale, Kingswood, Gipsy Lane, Putney, S.W.15, and George Wallace Bryant, 183, Victoria Road North, Southsea.

DYED CHEMICALS.—No. 105,920 (April 25, 1916). All photographers know the difficulty which exists in knowing when the elimination of chemical substance such as sodium hyposulphite has been reached. According to the present invention this difficulty is met in a very simple manner. For this purpose during preparation there is added to the reagent, which is afterwards to be eliminated by washing, a suitable colouring material, such, for example, as an aniline dye, chosen and carefully proportioned in such a manner that the colouration which it imparts to the emulsion disappears by washing at the same time as the last traces of the deleterious substances are eliminated. It will be understood that different colours are preferably chosen for different reagents which helps in the avoidance of any errors in the use of these reagents.

The method of preparing the chemical substance employed consists in incorporating the various photographic reagents and the colouring material in a finely divided condition in a syrupy or viscous liquid, soluble in water, such as syrup of sugar, glucose, glycerine, alkali silicates either alone or mixed together, and in general in all other suitable substances whether neutral acid or alkaline, according to requirements, in so far as they possess the property of preserving indefinitely a pasty form. Pastes thus formed are preferably enclosed, in known manner, in collapsible tubes of tin, or any other analogous or suitable material, these tubes if required being coated internally with an insulating or protecting varnish whenever the substances used are liable to attack the metal. The preservation of the reagents and colouring matter is thus doubly assured, as in a tin tube they are always protected from the atmosphere.—Alfred de Brayer, 38, Rue Etienne Marcel, Paris, France.

Trade Names and Marks.

APPLICATIONS FOR REGISTRATION.

VODETTE.—No. 387,774. Photographs and photographic papers. Albert Drummond Shiels, Thornhill House, Wishaw, Scotland, photographic artist. January 22, 1919.

New Books.

The Theory of Modern Optical Instruments. By Dr. Alexander Gleichen. Translated from the German by H. H. Emsley, B.Sc., and W. Swaine, B.Sc. (London: His Majesty's Stationery Office: for the Department of Scientific and Industrial Research. 12s. 6d. net.)

WHILE the achievements of British makers of optical instruments during the past fifty years have been by no means inconsiderable, the British literature of the subject has been scanty in the extreme. Whether that has been due to a large measure of resort here to rule of thumb and trial-and-error methods, or to our opticians taking their theory directly from the works of Continental writers, we will leave others to decide. In either case, the Department of Scientific and Industrial Research has done very rightly in seeking to endow optical technicians and students in this country with theoretical treatises in their own languages, and in default of corresponding works by English writers has selected several German text-books for translation. Dr. Gleichen's is the first of these to be issued; that by Dr. von Rohr on "The Theory of Optical Instruments" is to follow shortly.

It should be made clear that Dr. Gleichen's work is one on concepts—that is to say, on the expression in a form for practical use of the known facts of optics. It is a work of a kind which seeks to convert the wealth of optical knowledge into current coin which can be conveniently handled and render useful service. Therefore, the student who is interested simply in the physical facts of light will find little to attract him, just as a student of economics is not interested in accountancy or the technics of banking. The first part of the volume is devoted to a general consideration of the optical principles of image formation from the standpoint of providing formulæ for optical conditions of tracing the action of optical systems and of finding means for specifying them quantitatively. The properties and construction of photographic lenses form only a small part of the field which is covered, and in some respects appears to be the least satisfactory part. More than half of it is taken up by a very partial review of the types of anastigmatic objective, every one of which is of German origin. The book was written in 1910, so that one can hardly assume a want of opportunity for the author to have heard of British anastigmats. The only indirect reference (on p. 74), by omitting the name of the "Cooke" lens, makes it appear as though Mr. Dennis Taylor designed this objective for the firm of Voigtlaender. The passages dealing with the telephoto lens are equally—shall we say?—inadequate, historically. The translators, who in many footnotes greatly add to the value of the book, might very well have had a correcting word to say here, but it would seem that photographic lenses and photography are not their familiar ground. Their sentence that a certain lens is intended for "autochromatic work" may be a slip of the pen, or the phrase of one rather strange to photography. Nevertheless, for its treatment of the theory of the properties of a photographic lens, the book well deserves a place in the photographer's optical library.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

SATURDAY, APRIL 5.

Hackney Photographic Society. "The Importance of Photography in the War." A. Dordon-Pyke.
Rodley and District Photographic Society. Social Evening.

SUNDAY, APRIL 6.

United Stereoscopic Society. Social and Musical Evening.

MONDAY, APRIL 7.

City of London and Crippiegate Photographic Society. Members' Print Competition.
South London Photographic Society. Annual General Meeting.

TUESDAY, APRIL 8.

Royal Photographic Society. Special Meeting for Members only.
Chelsea Photographic Society. "A Journey to Rome." C. Pretty.
Hackney Photographic Society. "Some Things Seen in Holland." W. Rawlings.
Manchester Amateur Photographic Society. Monthly Meeting. "Bird Nest Photography." R. H. Blair.

WEDNESDAY, APRIL 9.

Croydon Camera Club. A Display of Novelties and Home-made Apparatus.
Ilford Photographic Society. Demonstration: "Compensators." R. H. Lawton, F.R.P.S.
Dennistoun Amateur Photographic Association.—Composition. J. Hack.
Photomicrographic Society.—Members' Evening.

THURSDAY, APRIL 10.

Hammersmith (Hampshire House) Photographic Society.—"Carbon Printing." A. C. Braham.
Hull Photographic Society.—Annual General Meeting.
Chelsea Photographic Society.—"A Journey to Rome." C. Pretty.
Richmond Camera Club. "Some Experiments with Polarised Light." F. C. Reynolds.

ROYAL PHOTOGRAPHIC SOCIETY.

MEETING held Tuesday, April 1, Mr. E. W. Mellor in the chair.

Mr. S. Bakerseff read a paper on "Commercial photo-copying processes" in which he dealt first with the various iron-printing papers employed in the making of contact copies of engineers' tracings and drawings. He gave brief working details of the ferro-prussiate or white-line paper, the ferro-gallic or black-line paper, and the cyanofer or Pellet process producing copies in blue line on a white ground from a tracing. The sepia process, as he pointed out, was one which is useful in making a negative copy from a tracing and thus allowing of a number of blue-line prints being made on the ordinary ferro-prussiate paper. For making inscriptions, etc., in white on the blue ground of a ferro-prussiate print he recommended a saturated solution of sodium carbonate, preferably the concentrated form of the carbonate sold as soda ash. The solution should be thickened with a little gum in order to prevent it from spreading. Arising out of a question in the subsequent discussion, Mr. Bakerseff said that the sodium carbonate solution did not give a perfectly white lettering, but the faint buff colour was sufficiently white for the purposes of architects and engineers. Comparing the two varieties of ferro-gallic paper, water-developing and that which is developed in a gallic acid bath, he pointed out that the latter was the variety to be chosen for use in tropical countries on account of the better keeping qualities of the sensitive paper.

The lecturer proceeded to show photographs and diagrams of the various types of machine introduced of late for the printing of these papers from tracings, etc. He said that the most technically perfect machines, in his opinion, were those designed by the Westinghouse Cooper Hewitt Company and employing mercury-vapour tubes as the illuminant. He described the working of stationary and rotating machines of this company, referring to the electrical devices by which the mercury light could be started without tilting the tubes.

In the later portion of his paper he dealt at very great length with the details of construction and manipulation of the Photostat copying installation.

Following a brief discussion the hearty thanks of the meeting were accorded to the lecturer.

PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

A MEETING of the Council was held on Friday, March 14, 1919. Present: Messrs. Adams, Basil, Chapman, Chaplin, Chidly, Corbett, Dickinson, Ellis, Fry, Gray, Haines, Hana, Illingworth, Lang Sims, Speaight, Spink, and Mackie.

The minutes of the last meeting were read and confirmed.

Accounts amounting to £44 were passed for payment.

A letter from Mr. T. C. Turner (Hull) was read regretting his inability to attend.

A letter from Mr. Montague Cooper (Taunton) was read, pointing out that the list of attendances of members of Council was not correct, and making other suggestions and criticisms. The hon. secretary informed the Council that he had checked all the attendances and had found them correct, and that he had written to Mr. Cooper to that effect.

The hon. secretary read a letter from Mr. James Webster, hon. secretary of the Otago Professional Photographers' Association, with reference to the formation of that association, and enclosing a photograph of some of the members.

A letter was read from Mr. Rigden (London), the hon. auditor, relative to the accounts, and it was resolved that Mr. Rigden be asked to make his suggestions to the annual general meeting.

A letter was read from Mr. Owers (Southsea) endorsing the action of the Council in proposing to raise the subscription.

A letter was read from Mr. Heineman, of Platè, Ltd., Columbia, stating that he had advertised in the "British Journal of Photography" for assistants, and desired the assistance of the P.P.A. in the matter of interviewing the applicants. Mr. Hana (London), and Mr. Illingworth (Northampton) undertook to see the applicants on the correspondent's behalf, the hon. secretary to inform the applicants when he received a communication from them.

CROYDON CAMERA CLUB.

MR. W. F. SLATER, F.R.P.S., arrived last week with "Useful Odds and Ends," including a finely developed cold, doubtless due to a tonic spring. He dealt interestingly and instructively with many things, fully described some short time back by the conscientious reporter of the South London Society.

However, one neat idea shown by him at Croydon was only hit upon the day previous to his auspicious visit. It consisted of an enamelled metal dish and container, by which hypo is compelled to abandon its tendency to skulk at the bottom. The dish proper has a series of V notches cut out of the top of two opposite sides. Inside the dish is placed a rectangular framework or container (practically a second "dish" without a bottom) of the same height, but of appreciably smaller area. This has inverted V notches, cut out of the bottom of two walls opposite each other. The prints are washed in the container, and the hypo is discharged through these notches and out of those in the outer vessel. The idea was considered very good, and a suggestion was made that an ordinary granitine dish might be used for the outer vessel if the walls of the container were higher than the dish.

To imagine Mr. Slater giving a demonstration on any subject without a passing reference to his beloved "time developments" would be an unworthy thought. He showed a most convincing set of prints from negatives of the same subject, which had received exposures in ratio 1 to 32. The negatives were all developed in a standard developer for a standard time at a standard temperature. If any other standards have been inadvertently overlooked, standard apologies are tendered. The topic, of course, drew criticism from those who believe standardisation is not invariably the best procedure for unstandardised subjects. On the other hand, Mr. Jobling who went off like an automatic, merry and bright, supported Mr. Slater strongly, but, mistaking his precise views, expressed a confident opinion that a varying period of development was necessary for subjects of varying contrast. Any who maintained the contrary were indisputably balmy. "Save us from our friends!"

But what led up to the most festive time was a statement made by Mr. Slater that if a passing cloud obscured the sun exposures for shadows would be less than when they were cast by direct sunlight. The point is not new, and it has been suggested that the untimely demise of Abel arose out of a discussion on the subject. If he originated and formulated it on Mr. Slater's lines the sequel is hardly to be wondered at.

Mr. Salt said, assuming the cloud to be only sufficiently large to cover the sun, he failed to see how the shadows were lightened. Retiring on various appeals that he should consult a mental specialist, others took his place. A terrible conflict of views followed, not due to any real difference of opinion, but merely owing to the mental muddle established, in which three distinct aspects lost independent existence, for clouds can obstruct, diffuse, or

reflect the sun's rays. The Chairman, Mr. Harpur, said he agreed with Mr. Slater. A simple experiment would prove the case. Let a piece of white and a piece of black paper be regarded in direct sunlight. The white will appear an intense white and the black "black." (Hear, hear.) Now let the light be diffused, and it will be found that the contrast between the two will also be reduced. "My hat!" exclaimed a member in despairing accents, in ignorance, no doubt, that Mr. Harpur was probably basing his contention on the old proverb: "All cats agree in the dark."

A most hearty vote of thanks was accorded Mr. Slater for a capital evening. For three weeks now the club has compulsorily run on the noble "dry" ticket. No noticeable improvement has been observed in any direction, and in English as she is spoke a marked deterioration has occurred. If only the party nominally responsible, Mr. Inskeep, would take a tip from the "movies," and with a six-shooter tickle the lower waistcoat of the club's wine merchant, things might revert to the normal.

Commercial & Legal Intelligence.

Limited Partnership.—Registered March 22. E. Fresco, photographers, 181, Oxford Street, W. Partnership for one year from January 1, 1919, and thereafter for so long as partners agree, provided lease of above premises is extended. General partner: E. Fresco, 230, Shaftesbury Avenue, W.C. Limited partner: Louis N. Viole, 6, Great Russell Street, W.C., contributing £150 in cash.

Balham Photographer's Affairs.—At the offices of the Official Receiver for the Wandsworth District, York Road, Lambeth, last week, the first meeting of creditors was held under the failure re Charles Frederick Michell, 121, High Road, Balham, S.W., photographer, against whom a receiving order was made on March 18, 1919.

The statement of affairs filed by the debtor showed gross liabilities amounting to £256 8s. 6d. of which £232 18s. 6d. was expected to rank against the estate for dividend. The net assets were returned at £13 5s. 8d., thus leaving a deficiency of £219 12s. 0d.

The debtor alleged his failure to have been caused through keen local competition, onerous terms of agreement relating to the business taken over by him at 8, High Street, Tooting, want of capital and heavy expense incurred in attempting to work two businesses at the same time.

The Official Receiver's report on the case was to the following effect, that the debtor, aged 49, who was adjudged bankrupt on March 18, states that after serving an apprenticeship with a photographer at Swansea and subsequently working with him and other firms at Swansea and in London, he, in November 1917, started business for himself as a photographer at 8, High Street, Tooting, under the terms of an agreement entered into with the Art Studios, Ltd., whereby he took over the lease of the premises and agreed to pay an average rental of about £223 a year, payable weekly; to include rates and taxes and the use of the photographic appliances, shop fittings, fixtures, and electric light. He had an option to purchase the lease and the appliances for £200, and paid (out of borrowed moneys still owing) a forfeitable deposit of £20, in respect thereof. He found three months after starting the business that it was not paying and took a vacant shop and house at 121, High Road, Balham, at a rental of £120 a year, in the hope that by working the two business together he might render them profitable.

On February 20, 1919, he informed the Art Studios, Ltd., he proposed to vacate the Tooting premises, but at their request, made for the purpose of selling the business as a going concern, he agreed to continue the business at an inclusive reduced rental of £2 12s. 6d. a week, on their promise to pay him one-half of any sum obtained for the business in excess of £125. On March 3 he was requested to vacate the premises, which he did, and was thereupon served with a default summons for £65 9s. 7d. claimed to be due in respect of rent and materials. Since that date he has traded only at the Balham premises. On March 18, 1919, he was summoned for non-payment of rates, £30 due in respect of the Balham shop, and filed his petition in order to avoid further proceedings.

The estate was left in the hands of the Official Receiver.

News and Notes.

Lancashire Society of Master Photographers.—An exhibition of work by members of the Society will be held in the Art Gallery, Blackpool, from May 27 to 30 next, both days inclusive. The exhibition will thus be open for inspection by members attending the annual general meeting of the Society, to be held in Blackpool, on Tuesday, May 27. It is hoped that members will contribute to making the exhibition a success by exhibiting at least three photographs each. All photographs submitted are to be mounted, on mounts not exceeding 20 by 16 inches in size. The entrance fee has been fixed at 7s. 6d. for each member competing and awards will be made by means of voting cards to be used by members of the Society. The latest day for the receipt of entry forms is Saturday, April 12. Forms and other particulars are obtainable from the Hon. Secretary, Mr. F. Read, 14, Balfour Road, Southport. A committee meeting of the Society will be held at the Chess Club, 65, Market Street, Manchester, on Tuesday, April 15, at 4 o'clock.

Colouring and Frosting Electric Bulbs.—The "Pharmaceutical Journal" gives the following formulæ:—The varnishes for colouring electric light bulbs are usually made by dissolving sheet celluloid (2 to 3 per cent.) in amyl acetate, aiding solution with a little methylated spirit, and then adding the desired aniline colouring. For producing a frosted or opaque effect, a sufficient quantity of light magnesia may be incorporated with the varnish; a very little quantity will suffice for the purpose. Or the frosting effect might be secured by first coating the bulbs with a solution of magnesium sulphate, 3; zinc sulphate, 3; dextrin, 2; in water, 20, drying thoroughly before immersing in or coating with the celluloid varnish. An American method of colouring is:—Make a solution by mixing the white of one egg, previously beaten to a froth, with one pint of distilled water. Filter, and skim the surface free from bubbles. The globes to be coloured are thoroughly cleaned and polished, then dipped in the liquid and hung up to dry. When dry, the dipping is repeated, and they are dried again thoroughly. The colouring solution is made by dissolving 10 to 30 grs. of any soluble aniline dye in 4 fl. oz. of collodion. In this the prepared globes are dipped and hung up to dry. The dipping is repeated if a darker tint is required.

Correspondence.

**** Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

**** We do not undertake responsibility for the opinions expressed by our correspondents.*

A GRID FOR THE DARK-ROOM SINK.

To the Editors.

Gentlemen,—On reading the article of "Practicus" in your issue of March 21, I notice that no mention is made of a kind of sink which I find most convenient. As perhaps it might be a useful suggestion for some of your readers, I will try and make as good a description of it as my imperfect knowledge of your language will let me.

The accommodation I use is a combination of board and sink. The actual sink occupies one whole side of the dark-room. This sink which is lead-lined is about one metre (3ft. 3 ins.) broad and 30 cm. (12 ins.) deep. Two planks (about 20 cm., or 8 ins., high and 4 cm., or 1½ ins., thick) are set along both sides of the sink. Thinner planks, 4 cm., or 1½ ins., broad, are laid transversely on these, reserving a distance of two centimetres (¾ in.) between each, thus providing the board on which all the "wet" work can be done. The smaller planks are fixed on to the big ones by means of appropriate notches made in these. Thus the small transverse planks can be easily removed if necessary.

I find this accommodation to have the advantages of the usual plain sink (ability to pour solutions away, etc.) without having its inconveniences (bottom and sides of dishes, and consequently fingers of worker getting soiled by various solutions, which is a source of trouble).—Yours sincerely, Denise Arnu.

4, Avenue Percier, Paris 8, March 26.

Answers to Correspondents.

SPECIAL NOTICE.

In consequence of general reduced supplies of paper, as the result of prohibition of the importation of much wood pulp and grass, a smaller space will be available until further notice for replies to correspondents.

Moreover, we will answer by post if stamped and addressed envelope is enclosed for reply: 5-cent. International Coupon, from readers abroad.

The full questions and answers will be printed only in the case of inquiries of general interest.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

J. D. S.—Many thanks for your note; you will see that we are making use of it on another page.

M. L.—Ferrid-cyanide and ferricyanide are the same chemical. The former is now an almost obsolete word.

R. K.—You require to apply for particulars to the Secretary of New Business Licences, 27, Bute Street, Cardiff.

C. M.—The camera is made by Messrs. W. Butcher and Sons, Ltd., Camera House, Farringdon Avenue, London, E.C., who should be able to supply slides to fit.

MICHEL.—The only French journal at present published, and the one which now, as before the war, contains the greatest number of small advertisements is the "Photo-Revue," published at 118, Rue d'Assas, Paris.

DAYLIGHT.—If you write to the Vanguard Company, Maidenhead, they will send you a pamphlet, reprinted from the "British Journal," describing fully the making of firelight portraits, according to the method published by the late Mr. Essenhigh Corke.

L. B.—The "Howellite" lamp for studio portraiture is supplied by Messrs. John J. Griffin and Sons, Kemble Street, Kingsway, W.C.2. The vignetter to which you refer is the "Bram," supplied by Messrs. Wahltuch Smith and Co., Ltd., 30, Chapel Street, Salford, Manchester.

GEORGE TAYLOR.—You do not need necessarily to take out a provisional patent, although it is very commonly done. You can if you prefer file the complete specification in the first instance. Probably many of the inventors who file provisional specifications have the intention of endeavouring to dispose of the invention before the costs of complete protection fall upon them.

SKETCH.—Evidently your trouble is due to insufficient illumination of the background. You do not say whether they are made by day or artificial light, but we should judge the latter. In any case, you require to place the sitter well in advance of the background, so as to allow you to get a strong illumination on the latter whilst screening the sitter, if necessary, with a movable head-screen.

H. W. S.—The objection to using a half-plate lens on a quarter-plate camera is that in many instances you cannot get sufficiently far away from the subject in order to include the whole of it with a lens which will be about double the average focal length for a quarter-plate. For the greater part of the negatives which will be made with a quarter-plate camera, the most suitable focus of lens is from 5½ ins. to 6 ins.

W. L.—If the portraits are on glass, they are collodion positives, and not Daguerreotypes. We should not imagine that they are original portraits of Queen Victoria and Prince Albert, but probably copies from some other photograph or painting, in which case their value is practically nil. On the other hand, if they should happen to be original portraits, the value should be considerable, although we have no means of judging what it should be.

SPARKBROOK.—You need a long-focus lens for obtaining satisfactory photographs of motor-cars; in fact, you can scarcely have one of too great a focal-length. For whole-plate negatives we should not hesitate to choose one of 30 or 40 inches focus. For half-plate negatives, a very good choice would be the 17-in. Telecentric, requiring a back focus of only 9-inches; or the Grandac Adon, which gives focal lengths from 25 to 50 inches.

S H.—Photo-button plates are difficult to get now, as they come almost entirely from America, and importation is prohibited. If you cannot get from Messrs. Fallowfield, you probably cannot get them at all. We do not know a formulæ for the developer.

The police in many districts insist on a hawker's licence. You have to get a new one in each police district. In some cases they will not require it—in others we know that they do.

B. E.—We do not know of any more satisfactory method than that of bleaching with a mixed solution of potass. ferricyanide and ammonium bromide, and darkening with soda sulphide. Any of the alternatives, such as the permanganate bleach bath or a bleach of bichromate and acid, are more troublesome in use, and have no compensating advantages that we know of. Presumably the irregularities arise either from the chemicals, the method of making them up, or from variations in the paper.

DAZZLE.—The formula for the persulphate reducer of Mr. H. W. Bennett is as follows:—

Ammonium persulphate	480 grs.
Soda sulphite	96 grs.
Sulphuric acid	48 minims.
Water	10 ozs.

This stock solution is mixed with nine times its bulk of water for use. We believe the solution can be kept for a very considerable time.

A. D.—We do not think the markings arise from the ferrotype plates. As regards the water supply, the only possible way in which it can produce markings is through it being highly aerated, as, for example, being drawn from a tap at high pressure and the prints soaked in it immediately before laying down. But this cause is certainly unlikely. You could make yourself sure upon the point by soaking the prints in water which has been freshly boiled, and allowed to cool. We have met these markings infrequently, and, so far as we are able to ascertain, the cause has lain in the paper itself.

The British Journal of Photography.

Line Advertisements.

Charges for Insertion.

Since advertisements cannot be inserted until fully and correctly prepaid, senders of line announcements are asked to bear in mind the scale of charges. They will thus save themselves delay in the publication of their announcements. A Schedule by which an advertisement can be correctly priced will be sent on request.

Net Prepaid Line Advertisements.

12 words or less	1/-
Extra words	1d. per word.

(No reduction for a series.)

Special Note. Box Number Advertisements.

"Box No." and office address ... ... charged as 6 words.

For forwarding replies add ... 6d. per insertion for each adv't.

If replies are called for this latter charge is not made.

Advertisements cannot be inserted until fully and correctly prepaid.

Orders to repeat an advertisement must be accompanied by the advertisement as previously printed.

Advertisements are not accepted over the telephone or by telegram.

The latest time for receiving small line advertisements is 12 o'clock (noon) on Wednesdays for the current week's issue.

Displayed Adv'ts should reach the Publishers on Monday morning.

The insertion of an Advertisement in any definite issue cannot be guaranteed.

HENRY GREENWOOD & CO., Ltd., Publishers,
24, Wellington Street, Strand, LONDON, W.C. 2.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3075. Vol. LXVI. FRIDAY, APRIL 11, 1919. Price Twopence.

Contents.

	Page
Ex-Cathedra	181
The Trade in German Cameras	182
Definition in X-Ray Photographs. By Auguste Lumière	183
Practicus in the Studio. By Practicus	186
Lithographic Transfers from Bromide Prints. By James Graham	188
Death of Sir William Crookes	189
Optical Glass	189
The British Photographic Research Association	190
The Physical Characteristics of X-Ray Fluorescent Intensifying Screens. By Millard B. Hodgson	191
Assistants' Notes	191
New Materials	193
Meetings of Societies	193
Commercial and Legal Intelligence	194
News and Notes	194
Correspondence—	
Combined Developer and Fixer for Ferrotype Plates	195
A Plate-Changing Case	195
Forthcoming Exhibitions	195
Answers to Correspondents	195

SUMMARY.

In consequence of the Easter holidays, advertisements to appear in the "British Journal" of April 18 require to reach our publishers not later than noon on Tuesday, April 15.

We regret to record the death on Friday last of the eminent chemist and physicist, Sir William Crookes, at one time, for a short period, editor of the "British Journal of Photography" and of the "Photographic News." (P. 189.)

M. Auguste Lumière has recently carried out experiments showing the variations in the definition of X-ray photographs which may result from the construction of the tube, and from the conditions under which it is used. The tests show that tubes vary greatly in their capacity for sharp definition, and that their quality in this respect also undergoes relatively small modifications according to the time during which current is passed through them and to the degree of vacuum. (P. 183.)

A comparison of the efficiency of fluorescent screens in making X-ray photographs is contained in the abstract of a paper from the Eastman Research Laboratory. (P. 191.)

In a contributed article Mr. James Graham describes the making of lithographic transfers from bromide prints by a modification of the Bromoil process. (P. 188.)

In his article this week "Practicus" deals with the construction of a studio which can be erected in such fashion that, if need be, it can be removed and re-erected elsewhere. (P. 186.)

The small current of trade in German cameras continues. We deal in a leading article with the somewhat unintelligent comments upon the matter made by a London evening newspaper. (P. 182.)

A contribution to "Nature" gives a very encouraging account of the progress made by British makers of optical glass. It is stated that the full range of Jena glasses is now obtainable from British firms. (P. 189.)

The British Photographic Research Association has published a brief memorandum outlining the fields of pure and applied research which are included within its scope. Laboratories are now equipped for the research work of the Association. (P. 190.)

A contributor to "Assistants' Notes" deals with the practical measures necessary in the development and printing of amateurs' films. (P. 191.)

An undue deposit of fog in a negative may greatly mislead as to its printing quality. In a paragraph on page 181 we draw attention to a few of the more common causes of fog, some of which, particularly those arising from the camera, are often unsuspected.

The many practical advantages of rolled over ground-glass for the glazing of certain parts of the studio are the subject of a paragraph on page 182.

EX CATHEDRA.

Organic Intensifiers. Many as are the processes which have been evolved by the ingenuity of the chemical experimenter, it cannot be said that we yet have a perfect process of intensification, speedy in use, performed in one operation, and thus capable of being stopped at the required stage and permanent in its results. Hitherto, with one exception, all intensifiers have been based upon the use of mineral or inorganic compounds, such as the metallic salts which exert an oxidising action upon the silver deposit, and thus, in one way or another, allow of an increase of density. The exception to which we refer—the single example of an organic intensifier—is that invented some eight or nine years ago by MM. Lumière, in which the oxidising agent is a quinone compound. The departure thus made into the infinitely wide field of organic chemistry is one which has not been followed, although there is every probability that among the many compounds and series of compounds of carbon which exist there are some in which the two properties of oxidising the silver image and of adding density when so doing are united. Now that the demands of photography, in the matter of developers, are becoming familiar to makers of organic products and intermediates in this country it may happen that the sister process of intensification may come in for a share of attention, even though the commercial rewards may be small in comparison with those yielded by a developer.

* * *

The Density of Negative Fog. The old idea that a negative must have a certain amount of clear glass is held by few printers now, but it is an undoubted fact that with a negative that is at all inclined to be on the thin side a very slight amount of fog reduces the printing value in a marked degree. It also gives a false impression of the real contrast present and prevents proper judgment of exposure when bromide or other development papers are used. It is an instructive experiment to reduce with ferricyanide and hypo one half of a foggy negative until the shadows are fairly clear, when it will usually be found that although the image, plus fog, appears fairly vigorous, yet, minus fog, it is really quite weak. It is therefore evident, when a negative clouds over in development more than it should do, that the development should be prolonged until considerable density is obtained; then when the fog is removed what is practically a normal negative will be left. If any one suffers from this class of negative, it is advisable that all precautions should be taken to avoid all possible causes of veiling. A very common one is diffused light in the camera; this may be through insufficient shading of the lens, to a dusty or cloudy condition of the glasses, or even to reflection from

imperfect blacking of the bellows or woodwork. It is a curious fact that in the wet collodion era, when there was much less liability to fogging, photographers were very careful as to shading the lens with long hoods, cones, or canopies, while now we may find people using rapid anastigmats with half-inch hoods or none at all, and this with ultra-rapid plates. The point should receive especial attention at the hands of those who go in for "fancy" lighting, with the lens pointing more or less directly to the light. With dirty lenses the remedy is obvious: a little alcohol and a soft rag are all that is needed, although a coating of dead black or even black velvet inside the lens tube, is a valuable addition, while treatment with a really dead blacking such as nigrogene on the bellows and framework should complete the cure. If the fogging occurs in the camera the edges of the plate where protected by the rebate should be clear, otherwise the cause must be sought in the dark-room. Coloured fabrics fade and some red glasses permit a considerable proportion of blue light to pass through. It is worth taking a little trouble in tracing the cause of fog in order to secure clean, easily printed negatives.

* * *

Glass for the Studio. A correspondent recently asked whether the use of rolled or ground glass for glazing the studio would obviate the necessity for white blinds or curtains in addition to dark ones. In our opinion, in an at all well-lighted position it would not do so, as although either kind would prevent the direct glare which sometimes comes through clear glass, there would be no effective control of the light. There is, however, much to be said in favour of what is generally called "rolled plate" for both roof and sidelights. For one thing, it effectually excludes all view from the outside, even when using artificial light, while another advantage is that the light is more evenly distributed about the studio, with the result that the shadows are less intense, and the exposures shortened in spite of a certain proportion of the light being absorbed. If the glass is neglected dust and dirt will accumulate in the ribs and cause considerable waste of light, but an occasional wash with soap and water, applied with a soft brush, will remedy this. Of ground glass we cannot speak so well. It certainly diffuses the light and is, therefore, useful where there are outside obstructions, for it is well known that a side light of ground glass will give better illumination if there is a wall near than clear glass will. On the other hand, it rapidly gets yellow in a smoky atmosphere, and it is then more difficult to clean than the rolled plate. Moreover, as it diffuses the light more than rolled or clear glass, it is more difficult to get decided effects in lighting with it.

* * *

Defects in Sketch Portraits. Few photographers pay sufficient attention to the lighting of the sitter when producing negatives for sketch portraiture, and many examples that we have seen in professional show-cases point to negligence in this respect. The charm of a good sketch portrait, in our opinion, lies in its fine tonal quality and delicacy, while if an over-harsh or too unequal lighting is arranged a very inferior effect is obtained. One of the best sketch portraits that we have seen was made with a decidedly flat lighting, but one that, at the same time, by the aid of first-class photography, was a delightful result of tonal quality and colour suggestiveness. While on the subject, a word may be added with reference to the sitter's costume. In the case of feminine sitters, the sketch portrait should always be in a high key, and, if possible, the receptionist should advise light clothing free from any trace of dark. We recently saw a bust sketch portrait of a feminine sitter in a high key that was absolutely ruined from the artistic point of view by the inclusion of a dark tie. The removal of this should have been tactfully suggested by the photographer. Many child-portrait sketch effects in a high key are considerably reduced in artistic value through a dark-coloured hair ribbon, and we have before us a delightful full-length sketch portrait of a youthful sitter in a light dress completely spoilt by reason of the fact that the sitter is wearing dark socks, or, perhaps, those of a colour that photographed too dark, if a non-ortho plate was employed. The above are some points that have a real bearing upon success and should be noted by all sketch portrait workers.

THE TRADE IN GERMAN CAMERAS.

SINCE the appearance of our note in the "British Journal" of March 28 last this unpleasant subject of the trade which is now going on in German cameras has cropped up in one way or another somewhat freely in the daily Press. For example, we have noticed two German cameras advertised for sale in the "Personal" column of the "Times." Both were described as new, and in one case the complete set, comprising a focal-plane camera of a type little sold in this country before the war, a well-known objective, and three double dark-slides, was offered at £24. Curiously enough a correspondent drew our attention to a new German camera at this same price being displayed in a London dealer's shop window. It is therefore evident that the trade is still going on and is passing, not merely through the channels of the lay Press, but also of the dealers' establishments.

A paragraph in the "Daily News" takes us to the source of this illicit trade. The writer quotes from a circular which, he states, is being distributed in the streets of Cologne. On the outside page is printed in big type, "Now's your chance. You will never get a good German camera as cheap again." On the inside pages of the circular are stated the name and address of the firm of dealers and the names of the photographic makers—the four best known in Germany—whose goods are obtainable. A characteristic touch is provided by the announcement in the largest type, "English spoken."

But the most remarkable contribution to this matter which we have met in the lay Press is contained in the London letter of the "Westminster Gazette" of April 2. The writer makes the most extraordinary deductions from the fact that a camera can now be bought in Cologne for about £6, which in pre-war times would have cost £13. According to him, the subsequent appearance of these cheaply bought cameras on the English market seriously disturbs the second-hand dealers here from the fear of the value of German-made lenses and cameras held by them being depreciated. If the writer had taken the trouble to find out he would have discovered that the volume of trade which has arisen since the armistice is altogether too insignificant to have the result he suggests. Certainly the dealers are disturbed—disturbed by the fact that the necessity of taking steps to put a stop to this trading with the enemy should be imposed upon them as a consequence of official apathy in taking the matter in hand. The Photographic Dealers' Association in a letter addressed to the "Westminster Gazette" by the President, Mr. James A. Sinclair, and appearing in the issue of the 10th inst., points out that in most instances dealers are refusing to deal in apparatus which has been made since the war commenced, and which is now reaching this country through the purchases of soldiers in the army of occupation, although the purchase and re-sale of these new cameras would be very profitable to them. But the writer in the "Westminster" is apparently obsessed with the idea that by some means or other

photographic dealers have during the war maintained the prices of second-hand German-made cameras at a highly profitable level, and is thus led to impute their desire to exclude the new instruments merely to motives of self interest. It would be interesting to know along what line of reasoning the writer eliminates the public from this conclusion. Let the dealer price his second-hand German cameras as high as he likes, or, for that matter, as low as he likes, they would stay on his shelves unless the public bought them. In matters of tariff reform writers in the "Westminster" are eager to lay emphasis on the laws of supply and demand on which obviously the sale of the goods in question solely depends. When war broke out there must have been very considerable stocks of German cameras distributed throughout the second-hand trade. Clearly no stigma could attach to dealing in them, and if, as we have said, the public has been willing to pay highly for them the dealers have been entitled to their profit. The writer in the "Westminster Gazette" now suggests that dealers "should have done with this trade" in order that they may avoid suspicion of selling new German cameras now coming into the country. Surely a drastic enough remedy for a state of things which has been none of the seeking of dealers in this country.

The only remedy for the present difficulty is that the bringing of these goods into the country should be prohibited. The leading dealers have no doubt set their faces against trading in the goods, but unless all are solidly united in this policy there will obviously be the inducement to every one of them to take part in it from the knowledge that if he does not purchase the goods somebody else will. Moreover, there are the channels of the auction room and advertisement in the lay Press. We believe that representations have been made to the Ministers concerned, but very little may be expected from those quarters. It may, therefore, be hoped that the whole influence of the Photographic Dealers' Association will be thrown on the side of reducing the market for these cameras. Probably the most effective means of this kind would be the publication of a list of dealers refusing to purchase any cameras which they have reasonable ground for assuming to be of recent importation. A restriction of market would have its reacting effect upon prices, and would thus apply the most effective discouragement to the bringing of these goods to London for sale.

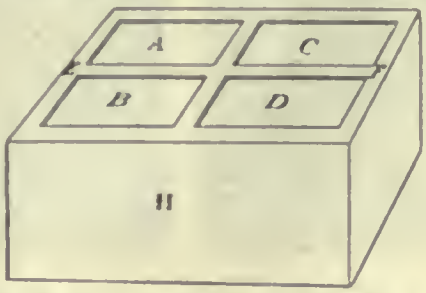
In conclusion, while we are upon the subject, we should not refrain from reference to a message by Reuter's Special Service from Cologne which appeared in the "Daily Telegraph" of March 31 last. Dealing with the wider opening of the door to trade between Germany and the occupied zone, and discussing also the resumption of trading relations between Germany and Great Britain as a means of Germany paying her share of war expenses, the writer singles out "camera parts, lenses, etc.," as goods which England "is ready enough to receive." It would be interesting to know what grounds Reuter's correspondent has for making a statement which every evidence goes to show is the very antithesis of the facts.

DEFINITION IN X-RAY PHOTOGRAPHS.

A Paper from the "Revue de Radiologie et d'Electrologie."

The images formed in X-ray photographs are produced, as is well known, from conical projections; they are the shadows thrown on a screen or photographic plate of objects of various degrees of permeability to the rays emitted from the X-ray tube and travelling in straight lines. Were the ray-source simply a point, the images would be of a high order of sharpness, and their size would vary simply according to the relative distances of the ray-source, the object, and the screen, diffraction phenomena which tend to distort the forms of shadows in the case of luminous rays not taking part to any appreciable extent in X-ray phenomena. But, in fact, the radiation is emitted not from a point, but from a surface the size of which can vary not only according to the tube which is employed, but also for a given tube according to certain conditions of its action.

In the use of a tube the bundle of radiations which is emitted appears to proceed from the centre of the anti-cathode from an area which is commonly called the "point of impact," but which, for practical purposes, is a surface of some area. Independently of this principal bundle, the passage of current in the tube gives rise to the emission of secondary radiations, which have their origin in the neighbourhood of the surface of impact at the level of the whole anti-cathode. Also the portion of the tube which is illuminated itself emits a certain radiation. These subsidiary radiant sources possess dimensions which are large relatively to that of the surface of impact. They cannot give rise to well-defined shadows, on account of their extended area, but their relative intensity is fortunately very small, and the influence which they exert upon the definition of X-ray images is of small degree. Their effect consists in the addition to the principal image of a species of general veil or fog, which reduces contrasts without modifying to any appreciable extent the definition proper. The object traversed by the X-rays diffuses in its turn other supplementary radiations, the injurious action of which is additional to that of those already mentioned. In the present study these secondary rays are not considered, the object being to investigate only the causes capable of modifying the surface of impact, which is the chief ray-source. The experimental



arrangement which was used is the following:—On a sheet of thin card, E, F, four rectangular spaces, A, B, C, D, were filled with wire gauze of various degrees of fineness represented by 11, 20, 36, and 44 threads per cm. These are the ordinary commercial metal gauzes. This test piece is arranged on a frame open at the bottom, as shown in the drawing, and of size to place the set of gauzes 10 cm. (=4 inches) from the sensitive surface.

The anti-cathode being placed at 50 cm. (= 20 inches) from the plane of the plate, a series of tests were made by working under normal conditions, which were kept as constant as possible, and by using different tubes. The negatives obtained were enlarged two and a-half times, in order better to display

the definition obtained. It is first to be noted that in normal use all the tubes do not give the same results. The images reproduced show that the definition varies with the different tubes. With a certain tube, A (Fig. 1), the four gauzes are visible; with another tube, B (Fig. 2), the structure of the test-piece can still be recognised, though less sharply, whilst with a third tube, C (Fig. 3), three of the gauzes out of four are visible, and two only out of the four when using a tube, D (Fig. 4). In another case (tube E) only the gauze of large mesh is recognisable (Fig. 5). Lastly, deformation of the images is sometimes encountered, indicating a surface of irregular impact (Tube F, Fig. 6).

Fig. 1.

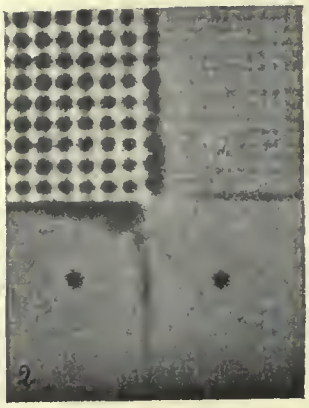


Fig. 2.

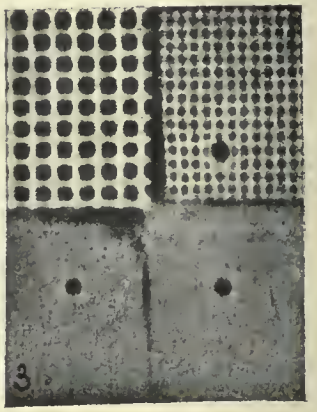


Fig. 3.

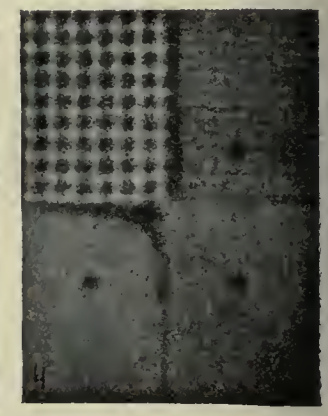


Fig. 4.

It may be asked if these differences, which are often considerable in comparing one tube with another, arise from the construction of the tube or from the conditions in which it is used. It therefore seemed advisable to discover if, during the use of the tube, the surface of impact sustained displacement or deformation capable of modifying the definition of the images; and in the same connection the influence of current intensity and of the hardness and age of the tube were studied. In making these tests the tube A, which in a preliminary trial had yielded the most distinct image of the four gauzes, was first used. An impression was made of the test-piece at the beginning of the period of operating the tube, and then after an interval of two minutes a second image was made with the same time of exposure, at the end of the period of action. The first image is a little sharper than that obtained after the two minutes: the same test was repeated after allowing the tube to remain in action for six minutes, and gave practically the same result, represented by Fig. 6. Thus the surface of impact is slightly modified—that is to say, appreciably extended—during the operation of the tube. Tests made in the same way with other tubes exhibited the same differences.

Fig. 5.

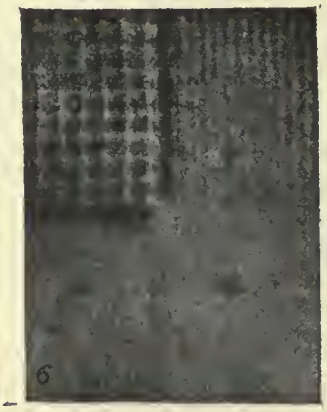


Fig. 6.

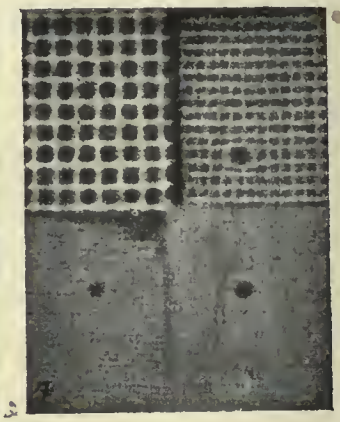


Fig. 7.

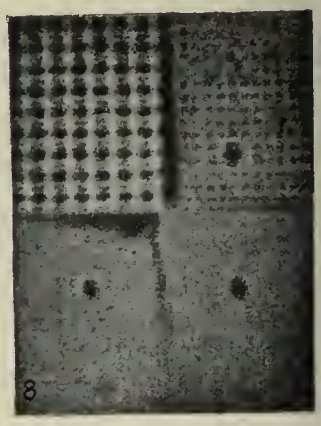


Fig. 8.

It therefore seemed desirable to discover if the surface of impact is displaced during the passage of current in the tube, and for that purpose, using the same arrangement as in the preceding experiment, plates were exposed for the same time (three minutes), but dividing this period of exposure into three parts, each of one minute, the first corresponding with the beginning of the period of the tube's action, the second with the mid portion, and the third with the end. There were thus obtained images the definition of which was slightly inferior to that obtained by a single exposure of three minutes at the end of the period of action. It therefore appears that the surface of impact undergoes slight displacement in the course of the operation of a tube for several minutes. Moreover, this result appeared to be confirmed by the comparison of two tests made with the same tube, one with an exposure of 1-100th second by means of a "flash" apparatus and the other of 5 seconds. The instantaneous image is a little better defined than the other, but in this experiment several conditions had been necessarily modified at the same time, and it is scarcely possible to draw definite conclusions from it. The comparative images are reproduced in Figs. 9 and 10.

The second question which has been examined relates to the modifications in the radiant surface consequent upon variation in the intensity of the current which passes through the tube. Precautions were taken to maintain the working conditions as constant as possible, and the definitions of images afforded by a given tube were compared in the different circumstances of

passage of a current at different intensities, in one case one-quarter of a milli-ampère and in another of 15 milli-ampères. These tests were repeated with different tubes, and the results invariably showed that differences in intensity do not appear to exert any appreciable influence upon the definition. The results are so similar that it is not necessary to reproduce them

It is, however, different when the degree of vacuum of the tube is varied. Using a hard tube, with a spark equivalent of 18 cms., a plate was exposed and the spark equivalent then reduced to 3 cms., a second plate being then exposed. The results were better in the case of the hard tube, but on repeating the same experiment with other tubes the results were no longer the same. It would appear that for a given tube there is a degree of hardness which corresponds with the maximum definition. The convergence of the cathodal rays thus appears to undergo variations according to the degree of vacuum, but these modifications, as shown in Figs. 11, 12, 13, and 14, are not of great importance. The figures show the extreme range of definition which it was possible to obtain in the course of the tests with a given tube. Thus, even when departing to a notable extent from the customary conditions of radiographic practice by varying within abnormal limits the exhaustion of the tube and its time of action, the differences in the definition are only trifling. The tube which allowed of recognising the four gauzes in the first test made under average conditions invariably rendered the test-piece, however the conditions of use were changed, whilst with the tube D it was never possible, by any modification, to obtain a rendering of the third gauze. It should be understood that the question which is here discussed is the defining power of the tube quite apart from the contrast in the image—two qualities which frequently are confounded. It is evident that the tube A of maximum hardness, and having a spark equivalent of 20 or 25 cms., will never distinguish tissues which are relatively permeable by X-rays: e.g., it failed to disclose stone in the kidney, though it rendered the four gauzes excellently, whilst the tube D did not suffice to yield definition of the two finer gauzes, however the conditions of its use were adjusted, but was perfectly able to yield satisfactory images of renal calculus when the precaution was taken to bring the tube to a suitable degree of exhaustion. Thus, from the point of view of definition each tube has its own characteristic properties, which are but slightly modified by the conditions of its use.

Fig. 9

Fig. 10

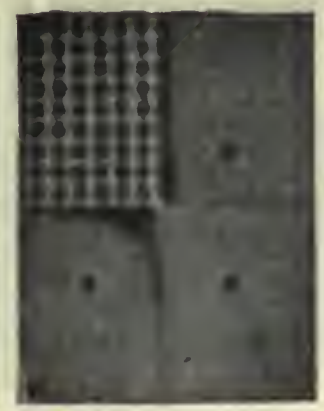


Fig. 11.

Fig. 12.

In the course of the experiments confirmation was obtained of the known fact that the definition of X-ray photographs increases in proportion as the distance of the anti-cathode from the plate. Using the same tube, placed successively at 30, 50, 100, and 150 cms. from the plate, and giving exposures inversely proportional to the squares of these distances, four plates were exposed, and yielded images which show the improvement in definition which results from a more remote position of the tube. The figures are 15, 16, 17, and 18 respectively. The results are mentioned here in order to show the degree of importance of the distance of the tube in X-ray work. Since want of definition in X-ray photographs appears to result from the fact that the ray-source is not a point but an area throughout the whole of which rays are emitted, it

Fig. 13

Fig. 14.

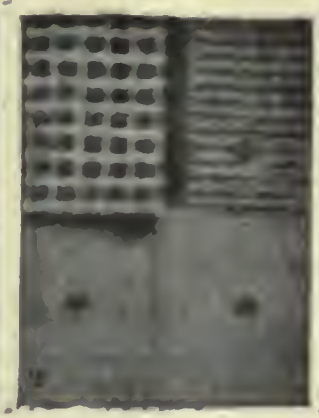


Fig. 15.

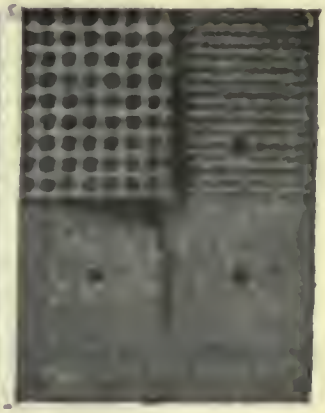


Fig. 16.

seemed that improvement should be effected in a certain measure by inclining the tube so that the anti-cathode is placed in a plane almost perpendicular to the surface of the plate. By thus working at the limit of the field, the surface of impact is presented almost perpendicularly to the plane of the plate, and thus becomes practically a line ray-source. If the supposition is correct the rays from this line-source should give exceedingly sharp shadows of lines of the gauze parallel to it. Such was found to be the case, as is shown by the two comparative images of Figs. 19 and 20.

All the tests were made with the tubes of Pilon, Muller, and Radiologie. It is proposed to carry out further comparison with the Coolidge tube, but it may be concluded from the experiments which have been made that improvement in the definition of X-ray photographs is a question of reducing the area of the surface of impact. The solution of this problem, which is beyond the scope of the present paper, but which it is hoped to discuss in a later communication, is not the only desideratum which may contribute to the improvement of radiographs, sharp definition being only one of the elements in the question. In addition, there are to be considered the defects introduced by secondary rays, and the influence of these latter is the subject of current investigation.

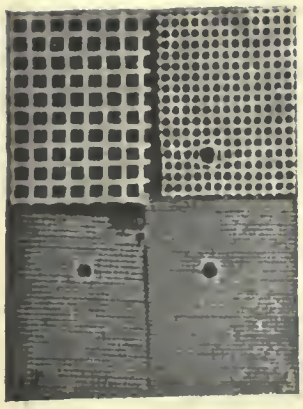


Fig. 17.

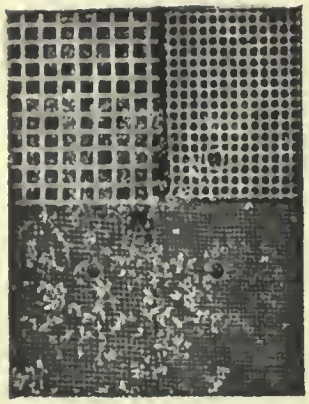


Fig. 18.

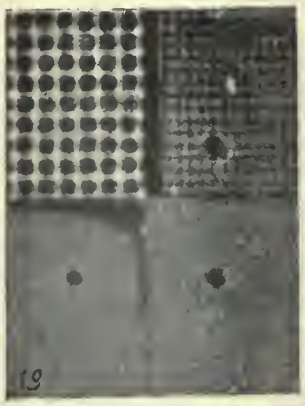


Fig. 19.

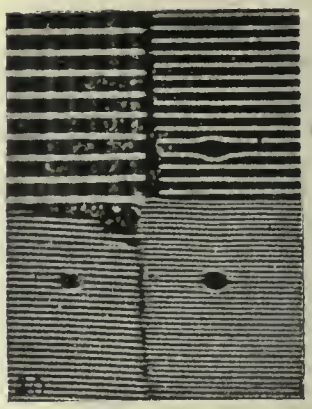


Fig. 20.

AUGUSTE LUMIÈRE.

PRACTICUS IN THE STUDIO.

[Previous articles of this series, in which the aim of the writer is to communicate items of a long experience in studio portraiture, have appeared weekly since the beginning of the present year. It is not thought possible to continue the series to the length of that by the same writer which ran through the "British Journal" some years ago, but if any reader among the younger generation of photographers, and particularly those engaged as assistants, has a particular subject which might be dealt with, his or her suggestion will be welcomed. The subjects of the previous articles of the series have been as follows :—

A Talk About Lighting (Jan. 3).
The Camera and the Lens (Jan. 10).
Managing the Sitter (Jan. 17).
Backgrounds (Jan. 24).
Studio Exposures (Jan. 31).
Artificial Lighting (Feb. 7).
Printing Processes for Portraiture (Feb. 14).
Studio Accessories and Furniture (Feb. 21).
The Surroundings of the Studio (Feb. 28).
Studio Heating and Ventilation (March 7).
The Postcard Studio (March 14).
The Printing-Room (March 21).
About the Reception Room (March 28).
Home Portraiture (April 4).

PORTABLE STUDIOS.

THE term "portable" has a wide range of meaning when applied to a photographic studio. It may mean a caravan on wheels, a wooden building which can easily be taken to pieces and erected elsewhere, a specially designed tent, or even a temporary shelter for the sitter and background, the camera and operator being in the open.

Studios in the first category—that is to say, of the caravan type—are now not so common as they used to be in the early collodion days, when many villages, and even small towns, had no photographer domiciled in them. There are, I believe, some which travel along with roundabouts, wild beasts, and fat ladies from fair to fair throughout the country, but I have not seen one for a good many years. Some of them were quite elaborate affairs, fitted up not only for glass positive and ferrotype work, but for printing on albumenised paper, the work often comparing favourably with that issued by many fixed studios. It may puzzle those who have never seen one to imagine how sufficient space was obtained, but this was easily done by adopting a telescopic form of construction, an inner body sliding out and being supported upon trestles.

The form which will probably be of most interest to the majority of my readers is not a studio that is here to-day and gone to-morrow, but one which is intended to remain in one place for months, if not for years, but which can, if needed, be removed and re-erected at small cost, and by unskilled labour. Such studios are usually made entirely of wood and glass, and their portability is due to the fact that there is no general framework, but that the whole is built up in panels, which are fastened together with ordinary iron bolts and nuts. I will endeavour to give some idea of their construction, which is quite simple and well within the powers of the village carpenter, or even of an amateur who has some idea of woodworking. The first thing to be decided upon is the size, and, this being done, a drawing should be made and the size of the panels settled. It is necessary to be very careful in constructing these that they should be exactly the size that they

are supposed to be, or there will be a lot of unnecessary work when it comes to fitting together. The design is usually the ridge-roof one, somewhat after the pattern of Noah's ark without the barge. For a studio 20 x 12 by 8 ft. (to the eaves) and 11 ft. to the ridge the following divisions will be convenient:—Each end is in two sections 6 ft. wide, one side being 8 ft. long and the other 11 ft. long. The two pairs of panels are exactly alike, except that one will probably have the door frame fitted into it. It must not be forgotten to keep the frames on the proper sides when nailing on the boarding, or they will have to be remade. I mention this because I have known three right-hand sections and one left-hand made, instead of two of each. The sides are made in four sections, each 5 ft. wide and 8 ft. high. Six of these are entirely covered with wood, and two have a cross-bar, say, 4 ft. up. Below this, wood is nailed on; above are sash-bars for the side-light. The roof calls also for six wooden panels and two which are frames only, fitted with sash-bars for the top light. These are all 5 ft. wide and about 7 ft. long, so as to give a slight overhang at the eaves. The edges which meet at the ridge should be bevelled so as to give a good bearing. For a studio of this size the frames of the panels should be made of 4 x 3 deal, and the boarding should be good yellow ⅞ matching. The frames may be mortised if the extra labour is not objected to, but "halved" joints answer quite well, as the boarding has to do its part in keeping the panels square; good cut nails should be used for fastening. The side and end panels should each have a crossbar half-way up, as not only does this stiffen the construction, but it keeps the boarding from warping. In all the panels the framing comes inside the studio, and the panels are fastened together by drilling holes in which the bolts fit well, and without shake in the frames, so that, when laid side by side, they are drawn closely together. In the end sections the bolts run through the boarding as well as the frame, and are tightened up in the same way as the side joints. It is perhaps hardly necessary to say that the woodwork should all be erected before the glass is put in the sashes, and that, in case of removal, the glass should be taken out before anything else is done.

Having made all our panels, we can assemble them. First the two ends are put together, and then the sides joined up to their full length. The back should next be joined to the ends, then the front fixed in, and finally the roof sections put up in pairs and screwed through on to the tops of the frames. Although not always done, it is a good plan to put one or more iron tie rods across at the level of the eaves to prevent any outward thrust. These should be ¾ in. to 1 in. in diameter, threaded at the ends with a good large nut put on both sides of the top of the side frames through which the rod goes.

The flooring is made in panels the width of the studio, and drops upon the lower part of the frame. There should be some arrangement of joists or brick piers to prevent vibration and sagging.

The roof will require a waterproof covering. This may be corrugated iron or the asphalt roofing material known as Ruberoid, or, if obtainable, Uralite, which is fireproof, may be used. This is a sort of asbestos and plaster composition, and would keep the studio cooler than iron. It has the merits of not rusting and requiring no paint.

A building erected in the above way will not keep in condition long if placed directly upon the ground; therefore, some foundation which will keep the lower part dry must be provided. For a reason to be presently given this should be of a temporary character, and one which we found very successful was a row of loose bricks all round, the exact size of the studio, with two rows at equal distances running from end to end inside. Upon these bricks rested four long deals 20 ft. long and 3 x 9 section; the sides of the studio stood upon this, and there was sufficient space between the bricks for air to circulate freely below. A studio so erected was taken down after nine years, and was found to be quite sound, as were also the long timbers.

If one is building upon another person's land it is necessary to be very careful to do nothing that will give the landlord a claim to the building. If a studio or greenhouse is erected upon a brick foundation which forms an integral part of it, the whole at once comes under the control of the landlord, and the tenant cannot legally remove it. It has been held in the case of a lean-to greenhouse that the driving of iron holdfasts into the wall of a dwelling-house to secure part of the framework removed the structure from the category of "tenant's fixtures," and made it a part of the freehold.

The foregoing description is necessarily of a sketchy nature, but I shall be pleased to fill in any details in the "Answers to Correspondents" column in case of need.

Tent studios are not much in favour in this country, as there is no possibility of using glass as part of the covering, and there is no waterproof material which will retain its whiteness for any appreciable period. Celluloid is, of course, out of the question, on account of its cost and inflammability. The most elaborate tent studio I have seen was one sold by the Stereoscopic Company a quarter of a century ago. It consisted of a wooden skeleton of the ordinary ridge-roof form. The parts usually solid in a permanent studio were covered with tightly stretched sail canvas; the top and side lights were without any permanent covering, and were fitted with dark and light roller blinds of the usual type. This was necessarily a rather costly affair, and a much simpler arrangement could be constructed with an ordinary small marquee as a basis. If an opening were cut in a suitable position and a light wooden frame, or frames, fitted with wires and festoon blinds put in, quite a useful studio could be made. Some years ago a woven wire roofing, the meshes being filled with a transparent varnish, was placed upon the market; it was tried for studio lighting, but, being rather yellow, caused the exposures to be too long. Now that plates are three times as fast it might be worth trying it again, if it is still made. I have often thought that a serviceable studio might be made upon what is known as the tunnel principle—that is to say, a comparatively short square compartment for the sitter and background and a small tunnel or passage without light for the camera and operator. This idea could be worked out in the form of a tent, and would have the great advantage of being economical of material and presenting the minimum area to wind pressure. It would not be difficult to arrange such a studio so that an ordinary shower need not interrupt work.

So-called "lawn" studios are merely devices for holding a background and curtains for cutting off the worst of the top and side light. Houghton's used to list a very neat arrangement of this type. It is, however, very easy to improvise something of the sort with four tent-poles and cords, a background, and some lengths of light and dark materials for curtains. All that has to be done is to fix the four poles at the corners of an 8 ft., or smaller, square, to run a cord round the tops, steady the whole with the ordinary ropes and pegs, and hang the background on whichever side suits the light. The lengths of material are hung over the top cord to serve as studio curtains. One friend of mine had four clothes post sockets fixed in his garden at the proper distances for a studio of this sort, and could drop the posts in, rig up the curtains, and get to work in less than ten minutes.

PRACTICUS.

A STOLEN GOERZ LENS.—Messrs. Boyde's Studios Limited, 108, Strand, London, W.C.2, advise us that a 1B Goerz Celor lens of 180 mm. focus, f/4 aperture, iris diaphragm and numbered 145169 was stolen from their premises on March 28 or 29 last. They will be grateful if anyone to whom the lens may be offered will communicate with them.

LITHOGRAPHIC TRANSFERS FROM BROMIDE PRINTS.

The Bromoil process has for several years had an important application in the lithographic trades as a means of readily making enlarged or reduced productions of line or "stipple" copies. The method also lends itself to the production of coarse-grained half-tone lithographs. In this process a negative is made from the original line or tone drawing, or from an existing reproduction. From this a bromide print is made of the size required, which is subsequently treated by a modified Bromoil process so as to become transformed into a lithographic transfer.

Details are given below of a method which has been produced after numerous experiments. These were undertaken by the writer with a view to obtain general reliability and ease in results.

Character of the Negative.

The negative may be made either on a dry plate or by the wet collodion process. It must be quite sharp. Line negatives should be made with a fairly large stop, or there will be a slight diffusion of detail in the finer lines. This is due to the fact that the anastigmat lenses generally in use are designed primarily to work at large apertures. *F*/16 to *f*/22 is about the correct stop to use. Half-tone negatives must have the dot formation well joined in the high-lights. The particular screen to use for half-tone work must be calculated. For example, if the print from the negative is to be enlarged two diameters and a 75 lines per inch grain is required, the negative must be made with a 150-line screen.

Making the Print.

The ordinary copying camera may be used for making the print, the negative being rigged up a foot or so in front of the copy board, which is covered with white paper, so as to reflect light through the negative. A better way, when work is to be done in quantities, is to use an enlarging lantern. Whichever method is adopted, care must be taken to focus quite sharp, and again to use a fairly large stop.

The most suitable developer is the regular amidol or diamidophenol formula, using plenty of bromide. The fixing bath must consist of plain hypo and water, and nothing more. Exposure should be just long enough to produce a full strength deposit in the finest lines. Development should be full. After fixing the print it should be washed for not less than ten minutes, and then dried.

Making the Transfer.

The print, when dry, is ready for bleaching. This should be done by means of the following bath :—

A. Copper bichloride	60 grs.	5 gms.
Ammonium chloride	240 grs.	20 gms.
Hydrochloric acid, about ...	20 drops	2 c.c.s.
Water	10 ozs.	400 c.c.s.
B. Sodium bichromate	12 grs.	1 gm.
Water	2½ ozs.	100 c.c.s.

For use take 2 ozs. (50 c.c.s.) A., ¼-oz. (6 c.c.s.) B., and 4 ozs. (100 c.c.s.) water.

The print should be fully bleached in about two minutes. Occasionally a strong print will fail to bleach right out. The partly bleached portions will, however, take the ink quite well. After bleaching, the print is washed for not less than four minutes in running water.

While the print is washing the inking slab should be got ready. Take a little re-transfer ink on the end of a palette knife and rub it out on an old litho stone, or other suitable slab, thinning it down with xylol or benzole. Turpentine is unsuitable for this process.

The washed print is now blotted off, and laid on a sheet of zinc or glass. Take a fairly tough letterpress roller, or better, a rubber-covered roller, and distribute the ink all over the inking slab, diluting with xylol until the roller has a tendency to skid over the surface of the slab. Now roll up the print with the roller in this condition. At first the print assumes a uniform grey tinge, and then, as the xylol evaporates, the stiffening ink leaves the whites and adheres more and more to the bleached parts. In a few seconds the maximum effect is reached and the rolling stopped.

The print should at this stage appear full of detail and of a greyish-black colour. There may be a very thin film of ink left upon the whites. In order to remove this, take a piece of thoroughly wet cotton wool and rub lightly over the print until clean. The transfer is then ready for the lithographer.

Weak Prints.

Sometimes a print is too weak in character for the bleaching solution to act with full effect. In this case it will be found that fine details do not ink up. Such a print may be saved by a re-development operation, as follows :—Clean all ink from the surface with a piece of cotton wool moistened with xylol, and then put it in an ordinary amidol developer, such as was used to make the print originally. It quickly blackens, and should be washed for four or five minutes, when it may be re-bleached in the Bromoil bleacher. No fixing is necessary before re-bleaching. The print will be found to have received an extra dose of hardening action, and will usually ink up well.

Inking up of the transfer by means of the Bromoil brush is favoured by some workers. It is useful at times for the purpose of bringing out portions of a print which may lack detail. In order to use a Bromoil brush some re-transfer ink must be mixed with a mere trace of boiled linseed oil and the tip of the brush charged with this, no xylol being used. The charged brush is dabbed upon the required parts of the print until sufficient ink has been taken up, and the inevitable dirtiness of the whites removed with wet cotton wool. The print can be persuaded to take up more and more ink by adding a greater proportion of boiled oil. As a rule, however, attempts at faking of prints are not to be recommended.

General Considerations.

Almost any grade of bromide paper can be used for bromoil transfers. The most suitable is a matt smooth paper, which is coated on a substantial base. It is well to be sure that the emulsion has a fine grain. Glossy paper gives bright-looking prints, which, however, the lithographer finds difficulty in transferring to stone or plate, owing to the extremely high relief.

Transfers may be re-inked and re-used a number of times, the limit being governed by the toughness of the paper base.

Some grades of paper have a tendency for the gelatine coating to strip off during inking. This tendency may be minimised by using the bleacher given above. Lack of strength hitherto has been, apparently, due to the softening of the baryta base on which the emulsion has been coated. By substituting ammonium chloride for the more usual sodium salt this defect is overcome. The object of hydrochloric acid in this formula is to enable ordinary tap water to be used. The acid neutralises any hardness in the water. Sodium bichromate was found to be the most reliable chromic salt to use.

Stretching of Transfers.

Sometimes it is important that the impression must be of exact size. In such cases the bromoil transfer process hitherto has been hardly feasible, owing to the tendency for the paper base to stretch unevenly. A bromide paper, known as Kerotype, has recently been placed on the market, which to a large extent overcomes this defect. It is a stripping paper—*i.e.*, the prints are first made on a bromide emulsion which has been coated on an impermeable base. These prints are then soaked in a mixture of spirit and water, and the emulsion is transferred by means of a gelatine solution to a suitable support, such as celluloid.

James Graham.

Mr. W. T Furniss, of 21, Fargate, Sheffield, has been elected on the Sheffield (Ecclesall) Board of Guardians.

Mr. John Ellis, the well-known photographer of Malta, was recently awarded the French distinction of Palmes d'Officier d'Academie, in recognition of his services during the war.

Rontgen Society.—The second Silvanus Thompson Memorial Lecture will be delivered by Professor W. M. Bayliss, M.A., D.Sc., F.R.S., of the University College, London, on Tuesday, May 6, at 8 p.m., in the Barnes Hall of the Royal Society of Medicine, No. 1, Wimpole Street, London, W.1.

DEATH OF SIR WILLIAM CROOKES.

We regret to record the death on Friday last, April 4, in his eighty-seventh year, of Sir William Crookes, the eminent chemist and physicist.

The life work in scientific investigation of Sir William Crookes could easily require a whole issue of this Journal for its adequate statement. Inasmuch as lengthy notices of his work have appeared in the daily newspapers it will be sufficient for us to deal with his connection with photography, which was direct and in some respects notable. We have no means of discovering by what channel Crookes as a young scientific man was led to take a special interest in photographic processes, but it is to be borne in mind that in the fifties and sixties of the last century when photography was a comparatively new thing its advancement enlisted the interest of leading scientific investigators to a much greater degree than in later years. Thus, when twenty-two years of age, he was asso-

The late Sir William Crookes.

ciated with Mr. John Spiller in devising one of the many processes of that day, which had the object of producing a collodion plate which could be employed "dry," and so overcome the drawbacks attaching to the wet-collodion process invented by Scott Archer. The process of Crookes and Spiller consisted in bathing the iodised collodion plate as usual in the silver bath and then immersing it in one containing also a little nitrate of zinc. The latter kept the plate sufficiently moist for it to be preserved for a day or two without suffering in sensitiveness. For the benefit of present-day students of the past processes of photography let it be observed that the term "dry-collodion," as applied to sensitive plates, is somewhat loosely employed. Probably more often than not the aim of experimenters was to obtain a plate which could be kept in a moist condition. Others, such as Dr. Hill Norris, succeeded in making plates which preserved their sensitiveness when quite dry, but this process may be said to be almost the only one which strictly corresponded to the generic title of dry-collodion, which was applied to these developments of Scott Archer's invention. A contribution to photographic processes, which is commonly attributed to Crookes in the text-books of the last century, is that of having been the first to use the light of burning magnesium for taking photographs. We cannot, however, trace this pioneer step in photography by artificial light to his original communication. The older literature contains also many contributions by Crookes in the field of the spectral sensitiveness of various silver compounds, but, after all, photography appears to have been purely a scientific hobby of his in his younger days, and, except that he constantly used it in his physical investigations, his active interest in it is confined to the comparatively early days of the science. In January, 1857, Crookes became editor of what is now the "British Journal of Photography," but which was then issued as the "Liverpool and Manchester Photographic Journal." Apparently his editorship lasted for only about two years, and in 1859 he became the first editor of the "Photographic News" on the founding of this periodical by Messrs. Cassells. So far as can be traced from the published volumes he held this position only for two or three years. In the sphere of X-ray photography Crookes will always be remembered as having provided the means, in the Crookes' tube, for the production of the rays, whose properties were first recognised by Röntgen.

Sir William Crookes and Mr. John Spiller. From a collotype print of about the year 1855.

In reproducing a portrait, taken a few years before his death, we may supplement it by one taken about the year 1855, and including Crookes's early collaborator, Mr. John Spiller, almost the oldest of the early experimenters in photography who are still with us.

OPTICAL GLASS.

[A brief review of the history and process of manufacture of optical glass in "Nature" of March 22 last contains references to the achievements of makers of optical glass in this country during the period of the war, which, from such a well-informed source, will be welcomed as conveying the assurance that opticians here will not be again dependent upon the German optical glasses. We quote the portion of the article which specially refers to the glasses required for photographic lenses.—Eds. "B.J."]

The advent of dry-plate photography and the special corrections desirable in camera lenses, as well as in microscopic objectives, gave a great stimulus to the work of German investigators, and their researches, carried out with more perfect technical appliances, had a wider aim in view than those of the English experimenters. The results obtained were of such promise and importance that Government assistance was forthcoming in the setting up of works for the manufacture of new glasses on a commercial scale, and the painstaking efforts of these men of science in overcoming the difficulties involved were eventually rewarded with well-deserved success.

As a result, opticians were compelled for many years to go to Germany for glasses having special properties such as were absolutely

necessary for them in the design of the better types of certain optical instruments. And, as many of the more important instruments during the latter part of last century were of German design, the firms concerned naturally transferred almost the whole of their orders from the English and French firms to Schott and Co., of Jena, and, in fact, so far as the military requirements of Germany were concerned, they were compelled to do so by the German Government.

It may be said, however, that the products of the English and French firms, as regards the older varieties of optical glass, were never surpassed by the Jena firm. This is evidenced by the fact that the English and French firms produced the great majority of the large discs for the giant astronomical refracting telescopes constructed during the last forty years. At the British Scientific Products Exhibition, recently held in London and Manchester, a fine disc of crown glass, 28 ins. in diameter, which was produced immediately before the war, was exhibited by Messrs. Chance Brothers.

The British firm, in particular, was slow in taking up the manufacture of the newer types of optical glass, and had to encounter serious disadvantages in coming late into the field in this respect, as also in being unable to obtain any Government assistance. The great value of the previous production of optical glass in this country, however, was felt at once on the outbreak of war, when Messrs. Chance Brothers were able to extend their resources, and, without outside assistance of any kind, to develop the manufacture of all the types of glass required by opticians, including some of the most extreme of the Jena varieties, which became necessary owing to an extended programme of work undertaken in connection with photographic lenses for aircraft.

In 1916 it was thought desirable (partly as a precaution against the results of possible aerial attack) that for the manufacture of this important material the nation should not be dependent on a single source of supply, and the Derby Crown Glass Works, Ltd., were encouraged to commence its manufacture, and they have already been successful in producing a number of types of optical glass of good quality. Still more recently the United States—though, to a large extent, dependent on English and French resources for optical glass for war purposes—have commenced its manufacture on their own account, and have already achieved some success in this direction.

Such are the demands of war on the optical industry that towards the end of hostilities one British firm was producing twice as much optical glass as the world's total output previous to the war. In considering, further, the position of the industry after the war, it is therefore obvious that there are resources in this country for the manufacture of all the optical glass which will be required by our opticians. Nor need there be any apprehension regarding the ranges of glass which will be available for the use of the lens designer. Without any notable exception, Messrs. Chance Brothers have been able, by their previous experience and by the work of their research laboratory, established during the war, to produce glasses which, in their optical constants, cover the full range of glasses mentioned in the Jena list for 1913.

Before the war computers designed lenses to utilise existing Jena glasses of definite optical constants. It would be undesirable and unfair to British manufacturers to reverse this process completely. Computers should be prepared to do a certain amount of recalculation, and so avoid imposing on the manufacturers the wasteful task of producing a glass to imitate exactly the hazard constants obtained in the particular foreign melting used previous to the war.

Presentation to Mr. J. Macwalter.—An interesting gathering took place on Friday last in the factory of Messrs. Elliott and Sons, Park Road, Barnet, to wish farewell and God-speed to one of the employees, Mr. James Macwalter, who had held a responsible position with the firm for thirty years. Mr Greenwood, in handing Mr. Macwalter a handsome gold watch chain, on behalf of the employees, said they had come to look upon Mr. Macwalter as a fixture. They were sorry to lose Mr. Macwalter, and wished him every success in the future. Mr. Hubert Elliott, on behalf of the directors, then handed Mr. Macwalter a beautiful gold semi-hunter watch, and, in doing so, said how much the directors appreciated the valuable work done by Mr. Macwalter.

THE BRITISH PHOTOGRAPHIC RESEARCH ASSOCIATION.

Programme of Research.

The following communication has been issued by the Council:—

The urgent necessity for the future development of British industry on a more scientific basis than hitherto has been recognised by the Government, who have placed a million sterling at the disposal of the Department of Scientific and Industrial Research for the purpose of encouraging research and its application to the development of British industries. The Advisory Council for Industrial and Scientific Research, after consultation with manufacturers and scientists, recommended that grants should be expended on a co-operative basis in the form of liberal contributions by the department towards the funds raised voluntarily by associations of manufacturers, established for the purpose of research. By this method the systematic development of research and its application to industry is carried out under the direct control of the industries themselves, and the co-operation of the firms in one industry will enable researc work to be undertaken which could not have been dealt with by an individual firm.

The manufacturers of photographic materials and apparatus were the first to form an association to avail themselves of the scheme, and in May, 1918, the British Photographic Research Association was formally incorporated. Dr. R. E. Slade has been appointed director of research, and laboratories have been obtained for the time being at University College, London. These laboratories are under the control of the director of research and are distinct from the teaching laboratories.

The Association will carry out research in photography, photochemistry and other related subjects, with a view to the general increase of knowledge of these subjects, improving methods of manufacturing photographic materials and discovering new photographic processes.

It is not the intention of the Association to attempt to standardise throughout the manufacturing methods of the photographic industry. Manufacturers will always insist on determining for themselves the lines on which their business shall develop. It is the aim of the Association, by applying scientific methods, to obtain knowledge which will be of the widest application to the industry, which may be utilised by each manufacturer for the development of his own particular processes.

Pure research into the scientific basis of photography, and into related subjects, such as colloidal chemistry and photo-chemistry, will be carried out for the increase of knowledge, without necessarily any immediate application of the results to manufacturing processes. These researches should open up new and important fields of applied research, and advantage will immediately be taken of any results of research which appear likely to lead to the progress of the photographic industry.

Among pure researches which are contemplated are the following:—

- Investigations into the fundamental properties of silver halides, and of the effects of various substances on these properties.
- Investigations into the physical and chemical properties of gelatine and other similar colloids.
- Investigations of a wide range of photo-chemical reactions.
- Investigations into colloidal chemistry.
- Investigations into the theory of processes of colour photography.

Publication of the results of pure research will be made from time to time in accordance with the rules of the Association.

Applied research will be undertaken to improve products now being manufactured, to improve methods of manufacture, and to introduce new photographic processes. These researches may be undertaken with a view to improving some process which is well known to require improvement or to overcome some difficulty which has arisen in manufacture, or they may be undertaken when some advance in pure science has been made which it seems possible to apply to photography.

Among the subjects of applied research will be the following:—

- Investigation of disensitising and reducing agents on sensitive materials, with particular reference to insensitive spots in plates and papers, and impurities in the raw materials used.
- Studies of the properties of various samples of gelatine with a view to arriving at the causes of the effects they produce and ultimately to obtain a standardisation and improvement of the product.

Investigation of various subjects relating to the construction of photographic apparatus, such as matt and semi-matt enamels, methods of treating wood, canvas and leather, and the production of special alloys.

Investigation of paper and cardboard.

Colour photography.

Improvements in apparatus and material for commercial and national purposes.

Researches will be carried out in the laboratory of the Association the Director of Research and his staff, or in other places by his general direction.

In applied research the Association desires that its work should not end at the point where a theoretical laboratory result has been achieved. It adopts as a guiding principle that its interest in and care for any one of its achievements should not relax until it shall have been adopted by the industry on a practical manufacturing scale. To this end the Association may make appropriate arrangements for carrying on or for experimental work with private individuals or manufacturing firms with a view to testing on a practical basis its laboratory result; knowledge of processes so achieved being at the disposal of all members.

The Association desires to be of the utmost possible use to its members individually, limited only by its position as trustee for the interests of the industry as a whole. It will welcome enquiries from members on technical points and will endeavour to reply helpfully either direct or by indicating sources of information. It has begun the foundation of its working library and is preparing for the collation and digestion of relevant scientific reports from home and foreign sources to be eventually available to members as a centre of knowledge. It may also, subject always to the aforesaid limitation, carry out specific items of research for individual members. Application for such services would require the approval of the Council with whom would be made such detailed arrangements as may be deemed appropriate in each case.

The programme set forth above covers a vast field for research; but with the help of members, from whom suggestions will always be welcomed, the Association hopes to explore first the most productive portions of this field. Results have already been obtained in the laboratory, which it is expected will have a wide application in the industry.

THE PHYSICAL CHARACTERISTICS OF X-RAY FLUORESCENT INTENSIFYING SCREENS.

(Abstract of a paper from the Eastman Research Laboratory.)

The use of fluorescent screens for the intensification of exposure is of widespread practice and of considerable importance in practical X-ray photography or roentgenology. Also in the work of Hull, St. John, and others, the fluorescent screen has been employed to reduce the lengthy exposures of X-ray spectroscopic investigations that are dependent on the photographic plate for record.

In dealing with fluorescent phenomena dependent on an X-ray tube for excitation there are two types to be considered, both of which may be utilised for photographic intensification. The first type is that of true characteristic radiation, the second ultra violet and visible fluorescent radiation. The true characteristic radiations of all the elements which are feasible to use are within that range of frequencies usually termed X-rays. Hence, the laws pertaining to high frequency radiation govern the photographic use of screens dependent on this principle. In the case of fluorescent emission of ordinary light the laws of ordinary optics apply.

Of these two types of intensifying screens, the second has proven far more efficient in practical usage.

Of the materials which fluoresce to X-rays in the range of frequencies from the ultra-violet to the red, there are only a few which can be used efficiently for photographic intensification. All of these substances must be in crystalline state. Of these, crystalline calcium tungstate is by far the best with present photographic X-ray materials. The salt is usually powdered and coated with a suitable binder on a support of some material of slight X-ray absorption, such as cardboard or celluloid. This screen is then placed in contact with the photographic surface and exposure made through either the screen or the photographic plate or film.

The efficiency of any radiator as a source of photographic stimulation depends primarily on the comparative spectral distribution of the energy of the radiator and the spectral sensibility of the particular photographic plates used. While these relations have not been determined as yet on an equal energy basis for X-ray materials, qualitative analyses have been made.

The fluorescent spectra of calcium tungstate were obtained, using a Hilger quartz spectrograph. A Coolidge tube of medium focus was used, the length of exposures averaging 1,000 milliampere minutes at 8-inch distance from the target to the screen.

Spectrograms were made with the tube operating at 40 K.V., 60 K.V., and 80 K.V. (R.M.S.).

It was found in general the fluorescent spectrum of calcium tungstate as used in the screens examined extended from about 3,600 to 5,200 A.U. at the voltages normally used in radiographic practice. This emission coincides remarkably well with the wave-length sensibility waves of the X-ray plates which are being mostly used.

MILLARD B. HODGSON.

Assistants' Notes.

Notes by assistants suitable for this column will be considered and paid for on the first of the month following publication.

Working for Amateurs.

AMATEUR photographers of Great Britain spend thousands of pounds annually in having exposures "finished." Most of this finishing is summer work, and this being the first peace summer, it is natural to suppose that more amateur photography—and therefore more finishing—than usual will be done. Now amateur finishing includes development, intensification, reduction, and retouching of negatives; printing, enlarging, and slide making; mounting and working up; so it might be surmised that the thousands spent on it find their way to professionals.

This, however, is not quite the case, for though certain professionals undertake such work, many more leave it to the local drug store. A great deal is also done by specialist firms, but leaving this out there is always some for the local professional who cares to cater for it.

For a studio to undertake amateur work with success, method and a certain amount of special tackle are indispensable. Given these, and there is no reason why a handsome profit should not result. The necessity for system cannot be over-emphasised. It is worse than useless taking in spools for development and handing them to the operator or bromide printer to put through with his own work. Nine times out of ten either the studio work or the spools, or both, would suffer.

Again, when quantities come along, it is extremely easy to mix up orders—unless the possibility is obviated by rigid book-keeping—and when amateurs' negatives get mixed or go astray it is often a serious matter.

No case of re-sitting here. Every spool, pack, or plate taken in for development must be allotted a number which must be booked along with the customer's name, and kept strictly to that spool, pack, or plate right through. At the same time, the number must not be conspicuous. The kind of numbering done on many studio negatives would not be permissible, and so certain firms avoid marking amateur negatives at all, but keep each in a numbered wallet, and exercise great care to prevent negatives and wallets from becoming mixed. This is very difficult when developing has to be done, and a simpler system is to number each plate or film on the extreme edge, writing with an H.B. pencil very small.

The most important line is development of spools, of which there are no less than sixteen common sizes. The best results are obtained by tank, and for large quantities of this work special tanks can be bought which take the films doubled over wires and hanging vertically, the ends being kept down by a weighted clip. The time and temperature method is advisable, normal development being given irrespective of exposure, and no after-treatment used to improve the result unless such is arranged for with the customer, who may be quite willing to pay for intensification or reduction, but may or may not desire it.

Various developers are used, but pyro-soda has by no means the

pull here that it has in studio work. Metol-hydroquinone has certain advantages, but perhaps the best of all is pyro-metol-hydroquinone, a formula for which was introduced some years ago by Messrs. Kodak, and has enjoyed much popularity since. It will be found toward the end of this article with other formulæ useful in amateur work.

Plain hypo or acid fixing may be used for films. With plain hypo it is possible to obviate the risk of metallic staining—due to corrosion of the hanging wires—by allowing the wires to silver-plate themselves, which they will do if given no cleaning beyond a rinse after each batch. Using acid fixing, there is some uncertainty, and many workers laboriously scrub the wires before and after using. The same applies to plate racks and pack film rods. The latter are metallic, and have twelve clips each, thus enabling one to develop the packs without mixing them. The use of these wires, rods, and racks makes the development and fixing of large batches a matter of minutes only.

The safest method of washing films is hand changing. The three-box washer is very serviceable for spools, as with it three batches can be washed at once. A type of this washer has been already described in the Journal, but for those not familiar with it a rough outline here will not be out of place. Briefly, the washer consists of three trays, each from four to seven inches deep, put in stair fashion, the water running into the top one and the overflow syphoning off into the second, and so on to the third, and then to the final outlet.

Films are put into the bottom dish for five minutes, after which they are moved one by one into the second, where they have another five minutes, being then moved singly into the top dish for a further ten minutes. A single tap will keep as many as sixty spools washing with a minimum of attendance. Spool film is best dried in a cabinet, hung from clips, with the bottom ends weighted. An electric fan in the top of the cabinet will greatly speed up the drying.

As already mentioned, after-treatment is best undertaken by arrangement with the customer, and here a good salesman is useful. By pointing out to clients what can and what cannot be done with a negative orders are improved and reputation and income increased. At the same time, it is wise not to accept responsibility when taking on intensification or reduction of negatives which have been developed elsewhere.

A second big item in amateur work is printing. For this work gaslight paper is essential, owing to its capacity for covering all kinds of negatives. The two varieties, soft and vigorous, are necessary, as is also a powerful light-source, which can be toned down when required, as amateur negatives vary greatly in density as well as quality. Black and white prints with narrow white edges are usual, though it pays to quote for sepia and mounted work, and also bromide, carbon, and platinum at times.

For dealing with quantities special printing cabinets are made which accommodate four printers, the lamp being a half-watt or a mercury tube placed centrally between the four desks.

Masks are supplied by the papermakers for the masking of all sizes. The best of these are the transparent ones, as they show at a glance if any part of the picture is being cut out—a point that must be carefully watched.

Enlarging for amateurs is profitable work if well done. Here again a powerful light-source is necessary, and gaslight paper also plays its part, though naturally bromide holds the palm. The usual lamp is the arc, but mercury tubes or a 2,000 half-watt will serve very well and require less attention. A hard and a soft bromide paper must be kept on hand, and for very thin flat negatives a vigorous gaslight paper will be found almost indispensable.

The method of working commonly applied to studio enlarging—making the best of each job and using discretion or artistic talent as to cutting out, vignetting, etc.—cannot be applied to amateur work without the customer's knowledge. This is another point where good salesmanship tells. Without specific instructions, it is always safe to make the picture dead sharp all over, and to include every bit of the negative, good or bad. Should one get an order in the dark-room for a 10 x 12 "all on and fill the paper" from a postcard negative—and this happens even in specialist houses—it is merely a sign of want of attention on the part of salesman or receptionist, and the best that the enlarger can do is to make a picture measuring 12 x 8½ approximately.

Minor improvements, such as shading, vignetting of dirty skies, or printing-in dense detail, are, of course, advisable, but cutting off, soft focussing, etc., are best left alone unless ordered.

Working with films a difficulty may be experienced in fixing them in the carrier. For this two really good ½-plate glasses will be needed and a set of masks. These masks had better be cut specially, and the following sizes will cover most negatives, if occasionally helped out with a right-angled strip or a straight piece.

The figures indicate inside measurements only, the outer dimensions being 6½ ins. x 4¾ ins. in each case:—2⅝ x 1⅝, 2⅞ x 2, 2⅜ x 2⅜, 3⅜ x 2⅜, 4⅜ x 3⅜, 5⅝ x 5⅜, 5⅝ x 3⅝, 5⅛ x 4⅛.

When correctly fitted to the negative a mask should show a 1/16-in. line all round. This line shows at once that the whole picture is in evidence, and that no small detail has been covered.

Another way of avoiding the risk of "cutting off" is to do without masks and work on to a black easel (to prevent fog), but the more usual practice is the use of masks.

Adjusting the films in the carrier can be facilitated by working on a window—illuminated from beneath—let into the bench. This dodge will save its cost in a busy shop within a week.

To cater properly for amateur enlarging good apparatus is a *sine qua non*. The demands range from ¼-plate to 30 x 40 and larger, and there is no limit to possible requirements in quality. At the same time, adequate prices can be obtained for this work.

Copying and slide making are in demand by amateurs. To cater for either of these lines the photographer must be able to cope with a variety of originals. A good copying bench capable of a big range, a selection of fast, slow, and process plates, and there should be no difficulty in obliging and profiting by the most fastidious or exacting client.

The following tip, however, may be useful. When dealing with an original that is not critically sharp, include on the plate, if possible, a small piece of letterpress. This forestalls any complaint of want of definition in the new negative.

The making of slides will necessitate the use of at least two varieties of plate—bromide and gaslight. Process slides may also come in handy, but on no account should one plate be made to cover everything. The use of the most suitable kind, and also recourse to the enlarger occasionally, will pay in the end.

Mounting, spotting, and working up and retouching are all profitable lines with amateur work. The former should, of course, be plain—i.e., the professional's name must not appear on any mount—beyond that it is usually safe to work by one's own judgment. Spotting, etc., can be measured by price or otherwise.

It will be gathered from the preceding that to cope with any quantity of amateur work some amount of apparatus and formulæ more than what is usual in studio work will be necessary. Developing tanks, drying cabinets, and drums, and printing machines are the most important pieces of apparatus, and they are supplied by the manufacturing firms who make a specialty of amateur requirements.

The practical man can make the cabinets for himself; the tanks and printing-room appliances are better bought. A film drying cabinet can be made from a large cupboard by adding cross-bars to the top and removing part of the floor to allow ventilation. For quick drying a hole can be cut in the roof and an electric fan placed above to blow downwards. On the cross-bars, not less than 4 ins. apart, clips are fixed to hold the films, the bottom ends of which are held down by other and heavier clips. Letter clips will serve, or the special clips made by photographic manufacturers for the job.

With regard to formulæ, the use of those recommended by the particular maker is advisable. The following, however, are very serviceable:—

For tank development of films:—

Metol	130 grs.
Hydroquinone	1 oz. 50 grs.
Soda sulphite	1¼ lb.
Soda carbonate	1¼ lb.
Pyro	200 grs.
Potassium bromide	60 grs.

This formula was introduced by Messrs. Kodak, the quantities

given being those sufficient for one of the Kodak tanks. It is an exceptionally good developer, with great keeping properties.

For prints:—

Amidol	200 grs.
Soda sulphite	5 oz.
Potassium bromide	30 grs.
Water	60 oz.

Suitable for all makes of gaslight paper and for bromides if diluted with one part of water to every two parts of developer. This formula has the advantage of giving excellent results with different makes and varieties of paper. Where metol-hydroquinone is preferred, the proportions advised by the papermaker should be adhered to. The advantage of M.-Q. is its keeping quality, which allows the making up of stock solutions

For intensifying plate negatives:—

Soda sulphite	4 oz.
Iodide of mercury	90 grs.
Water	10 ozs.

The intensifier, if kept in the dark, will last fairly well, and is safer with strange negatives than mercury-ammonia.

For films, copper ferricyanide is better than a mercuric solution. This tones them red, and greatly increases the scale of contrast. Another method of intensifying films is to sulphide-tone them.

Having run over the gamut of amateur work, a word as to prices will not be out of place. To give a detailed list of prices for the hundred and one large and small orders usual with amateurs would involve too much space. Such a list, however, might be obtained from a manufacturer, though the practical business man need not hesitate to draw up his own charges.

Prices should be kept as high as the class of customer and the opposition will allow, but small orders offering perhaps but a shilling or two should not be neglected. The making of a single postcard enlargement for an enthusiast may prove a big advertisement and lead to further and better orders. On the whole, amateur photographers are an appreciative class, and don't mind paying for good stuff.—THERMIT.

Renovating Picture Frames, &c.

A most useful varnish to use for stained wood or composition frames, which makes the appearance equal to new, can be made of best "pale goldsize." If we wish to use it on an old composition frame, the frame should be washed over first with soap and water, and put aside until perfectly dry. Then the parts which are rubbed or knocked should be touched up with stain to match; then, using the "goldsize" as ordinary varnish, put on with a soft brush and put the frame aside in a place to dry, free from dust. It dries quickly, and if done nicely makes the frame as good as new. In the case of ordinary oak frames, which have to be stained or darkened, these can be coated over with the "goldsize," and if it gives too much gloss the "goldsize" can be thinned down with spirits of turpentine until it gives just the required finish. If the "goldsize" is of good quality it should dry as hard as a stone. If it does not dry perfectly, add a little terebine to the "goldsize" previous to using.—E. HINOR.

New Materials, &c.

AKRON DRY MOUNTING TISSUE.—The Akron Manufacturing Co., 569, High Road, Tottenham, London, N.17, send us samples of a dry-mounting tissue which they are newly introducing upon the market. The tissue is evidently of an exceedingly good quality, highly flexible and free from colour, whilst no fault can be found with it in the readiness with which it is handled in the press. It is supplied in rolls of 30 feet by 25 inches, price 7s. 6d., or 30 feet by 31 inches, price 9s. 6d. In cut pieces it is supplied in gross packets ranging from 3½ by 2½ to 20 by 16. In half-plate size the price is 4s. 4d. per gross; whole-plate 8s. It is also supplied in quires of 20 by 24 inches, price 10s.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

TUESDAY, APRIL 15.

Royal Photographic Society. "Colour Values in Monochrome and a Viewing Filter as an Aid to Obtaining Them." F. F. Renwick, F.I.C.
Hackney Photographic Society. "Opening of One-Man Display." H. E. Wood.
Manchester Amateur Photographic Society. Demonstration: "Copying." T. E. Simpson.

WEDNESDAY, APRIL 16.

Croydon Camera Club.—"A Walk in Wanstead Park." A. E. Farrante.
Leith Amateur Photographic Association.—Social Meeting, with Whist.
Dennistoun Amateur Photographic Association.—Annual Exhibition.

THURSDAY, APRIL 17.

Heddersfield Naturalist and Photographic Society.—Lantern Lecture. A. C. Ellis.
Hammersmith (Hampshire House) Photographic Society.—Annual Exhibition.
Rodley and District Photographic Society.—Monthly Competition. "Winter Landscape."
Tunbridge Wells Amateur Photographic Association.—Demonstration; "Auto-Tank Development." R. J. Sells.

ROYAL PHOTOGRAPHIC SOCIETY.

The meeting of Tuesday evening last was one of members only, held for the purpose of discussing the formation of a scientific group within the Society. The discussion was one to which reference is advisedly postponed until the official report of the proceedings in the Society's Journal.

CROYDON CAMERA CLUB.

DR. F. KNOTT, an old member of the club, though far from a veteran in years, gave a lecture, entitled "Visual Psychology," which escaped improvement by the secretary, probably owing to doubt as to its significance. Others shared this, for some came prepared to hear a dissertation on the mystic and occult; some conjectured a certain lovely maiden beloved by Cupid might receive attention; whilst the majority preferred to "wait and see," and, when last week they saw, found seeing was not necessarily believing. As a matter of fact, Mr. Foster Brigham was down for the date, but remained up at Scarborough. However, he sent such a nice letter of apology, with references to "unforeseen circumstance" and the "daffodil disease," that all forgave his absence.

Dr. Knott's paper consisted of two parts—the psychology of form and that of colour. It took over an hour to deliver, read at express speed, but with excellent articulation. The subject was treated in a truly scientific manner, yet in a way readily to be understood by an unpsychological audience. The few extracts selected for report give no idea of its scope.

Psychology, he said, is a large subject, and the visual branch by no means its smallest. It consists of the scientific study of the nature and course of experience. We know a thing, and sometimes we know that we know a thing, but more rarely do we know that we know that we know a thing (*sic*, nothing could be plainer). Classification is important. There are many kinds of sensations, and we are equipped with receivers for all the chief kinds of physical energy, except electricity. Light is especially interesting to photographers as predominantly visual creatures. The eye may be considered as a little camera, with its lens, more or less perfect, capable of being focussed and stopped down, with the retina acting as a focussing screen, the image being upside down, which is reversed by the brain.

The chief faults of the eye correspond with those from which lenses suffer, spherical aberration and astigmatism being present, amongst others. Optical lenses are made of transparent glass, but the media of the human eyes are slightly turbid, causing "irradiation," which has the same subjective effect on objects as actual turbidity has on objective things. The angle of view of the two eyes is enormous, no less than 180 deg. in the horizontal meridian and 120 deg. in the vertical, the images received being minutely finished in the centre, and only roughly sketched at the borders.

There is one spot of extreme sensitiveness in the retina, and another of absolute blindness at the attachment of the optic nerve; but, as in binocular vision the two blind spots never coincide, the

defect is unnoticed; also, they almost invariably affect those parts of the field to which, at the moment, attention is not directed. The blind spot is so large that it might prevent our seeing eleven full moons placed in a row. (It transpired in the discussion that this phenomenon has no connection with the two moons seen side by side under certain conditions.)

All are colour blind, the outermost retinal zone being absolutely blind to colour; then come intermediate zones with partial colour vision, and, finally, the innermost with complete colour perception. The lecturer then passed on to an exhaustive consideration of binocular vision, perspective, and the theory of colour and its relation to vision. He also showed a large number of highly interesting optical illusions dealing with form, magnitudes, and colour. Considerations of time and space preclude these being touched upon. It should, however, be mentioned that Mr. Sellors alleged that he saw quite correctly many things which correctly he should have seen incorrectly—typical of the secretary's perversity.

In the discussion a point raised by Mr. Reynolds resulted in a pretty flare-up between him and Mr. Purkis, the "office boy" energetically fanning the flames, only to find himself enveloped. If any reader with a kind heart and sufficient knowledge can throw any light on the points in dispute, it may avert a repetition of the peculiar triangular duel described by Marryat. The facts are as follows: A cardboard disc, painted blue and yellow, on being revolved, appeared white. An assumption was then made that the same colours be applied in minute dots in juxtaposition on a piece of white cardboard, when it was agreed that, viewed from a distance, a green sensation would be received. Therefore, why a white sensation in the first place and a green one in the second? About an hour after a hearty vote of thanks had been accorded the doctor for an evening of unusual interest the disputants separated. Mr. Purkis departed resolved to think the matter out; the office boy left with an equally firm resolve in an opposite direction, and Mr. Reynolds and his gentle, compassionate smile melted into the night—a smile, by the way, which simply touts for trouble.

Sheffield and District Professional Photographers' Association.—The usual monthly meeting of the above Association was held in Stephenson's Café, Sheffield, on April 2. There was a good attendance of members, and one new member was enrolled. The evening was occupied in a general discussion on the following subjects: Minimum prices for postcards, the assistant question, keeping a register of employees open to engagement, the training of disabled men as assistants, etc. The secretary was instructed to ascertain full particulars of the Government's proposition for the training of demobilised men with a view to commencing in business as photographers. It was decided to make an effort to induce district photographers to become members of the Association. A very pleasant evening was spent, and members seemed to take more interest in the future of the Association than has been apparent for some time. The subject for discussion at the next meeting is, "The Best Artificial Lighting for Studio Portraiture." The Association is open for new members. The hon. secretary's address is 137, Pinstone Street, Sheffield. Manufacturers are invited to demonstrate new goods, apparatus, or novelties at any of the Association's meetings.

Commercial & Legal Intelligence.

A Photographer's Affairs.—At the London Bankruptcy Court, on Friday last, before Mr. Registrar Francke, the public examination was appointed to be held of Harold Aylmer Jones, photographer, 7, Gloucester Terrace, Kensington, W., formerly of 30, Hill Street, Richmond, who alleged his failure to have been caused through loss on the business at 7, Gloucester Terrace and loss of business through domestic differences with his wife, who had obtained judgment against him for arrears of an allowance under an Order of the Court.

Upon the case being called on for hearing, Mr. F. T. Garton, who attended as Official Receiver, said the debtor had given the Court a good deal of trouble. He had written to say that he had filed the best statement of affairs it was possible for him to make out, and he asked for an adjournment on the ground of ill-health, but he had not fortified his application with a medical certificate.

The statement of affairs was very incomplete, and the debtor had only attended once upon the bankruptcy officials since he was previously before the Court; therefore, he asked that the examination might be adjourned *sine die*. When the debtor appeared at the Court on the last occasion he certainly looked unwell, but as he was not present on this occasion he thought the examination could be adjourned *sine die*.

The Registrar granted the application upon the ground that the debtor had not given a reasonable excuse for his absence.

News and Notes.

Bromoil Portraits.—While the exhibitions testify to the beautiful quality attainable in portraits made in Bromoil, professional photographers, with one or two exceptions, have ignored the process altogether. The technical experience necessary is obviously one reason for this, and therefore we may refer to the work in this field done by Mr. F. T. Usher, of Durham House, Cumberland Road, St. Albans, who is a maker of bromoil prints and enlargements from photographers' negatives. We recently had an opportunity of seeing the fine quality which characterises Mr. Usher's bromoils, and has its origin in the fact that the work is done out of a strong liking for the technique of the process and a desire to realise its possibilities in yielding results of artistic excellence. By customers able to appreciate the distinctive merits of the oil-pigment prints a high price is willingly paid, and therefore photographers who are in the position of being asked for such work will be glad to make a note of the source from which it may be obtained.

Silverline Sketch Portraits.—In referring the other week to the special service for photographers now being offered by Mr. D. Charles, 363, Garratt Lane, Earlsfield, S.W.18, we mentioned a specialty to which we may now refer as the result of examining a considerable number of examples of his work in this branch which Mr. Charles has sent us. These are "silverline" portraits in the sketch style, and with the necessary freehand work introduced photographically from a pencil drawing. The reproduction of the pencil effect is very well done and the vignetting of the subject itself equally good. We have our own opinion as to the artistic merit of mingling a photographic image with pencil work, but the demand for such sketch embellishments of vignetted portraits is widespread, and therefore photographers anxious to show their customers something distinctive will be glad to avail themselves of Mr. Charles's services. He is a specialist in blocking-out and vignetting work and the prints before us show the very successful application of these methods to exceedingly diverse subjects.

White-Margin Masks.—The firm of Artista, 5, Rue de Montfaucon, Paris, VIe., send us samples of the white-margin masks which they supply in a wide range of sizes for the making of prints in which an even white margin is desired. They are of two patterns, for plates and films respectively. The former consists of a strongly made cardboard frame having an aperture the size of the negative. Around the aperture is attached a mask of non-actinic paper which, when the negative is printed gives the required white margin. In the case of the masks for film negatives a hinged carboard back is provided in order to facilitate the introduction of the film negative and the paper behind the mask. Those who have had much occasion to handle film negatives in making prints of this kind will appreciate this little device, which immensely simplifies the adjustment of the negative and paper. The whole mask, is of course, intended to be placed in the printing frame or it may be used, as can that for glass negatives, on the bed of a box printer. The masks can also be obtained with oval apertures as well as with those of fancy outline. A good feature common to all of them is that they are made so as to utilise the maximum area of the negative. The sizes range from vest pocket to half-plate and the prices from 3d. to 7d. in the case of masks for glass negatives and from 6d. to 1s. 3d. in the case of those for film. Other and larger sizes can be made on application.

Correspondence.

**** Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

**** We do not undertake responsibility for the opinions expressed by our correspondents.*

COMBINED DEVELOPER AND FIXER FOR FERROTYPE PLATES.

To the Editors.

Gentlemen,—I see in your "Answers to Correspondents" to-day that you are unable to furnish a querist with development formula for photo buttons. In pre-war times I frequently made up the following for street operators: The plates are developed (and partly fixed at the same time) for two to three minutes, according to the temperature, and are then examined in daylight and fixed in plain hypo. More ammonia added to the developer gives more vigour, if required.

Water, to make ...	40 ozs. fluid
Hydroquinone	½ oz.
Soda sulphite	4 ozs.
Soda carbonate	4 ozs.
Hypo.	8 ozs.
Liq. ammonia .880	2 fl. ozs.

E. W.

A PLATE-CHANGING CASE.

To the Editors.

Gentlemen,—I have found the use of a changing-box a necessity on several occasions, and perhaps the following description and illustration of one I constructed for my own use may be of service to some other of your readers. I bought a gramophone-record case for four shillings, which took my half-plate camera, three double dark-slides, box of plates, empty plate-box, and focussing-cloth, all nicely packed. From the construction of the case it struck me there was a possibility of using it also for plate changing. The lid of the box is hinged, and as it drops forward forms the bottom

of the changing bag. A double thickness of turkey red twill is used for the top and sides, and for the purpose of keeping the material in position on the box a band of strong wide elastic is employed. A small piece of leather covers the space between the lid and the box—i.e., the portion where it is hinged, so as to ensure it being perfectly light-tight. The sides of the fabric are sewn to the lid of the box, and when not in use this fabric folds up and fits inside the lid and takes up but very little space. A small buckle and strap completes the outfit, which I consider the cheapest and most compact I have yet seen, and one which has stood severe testing against fog.—Yours truly,

Barrow-in-Furness. A. DREWITT.

FORTHCOMING EXHIBITIONS.

April 17 to May 22.—Hammersmith Hampshire House Photographic Society Annual Exhibition. Two open classes. Joint secretaries, J. G. Abrahams, 41, Hamilton Terrace, London, N.W.8; A. H. Page, 12, Lime Grove, London, W.12.

Answers to Correspondents.

SPECIAL NOTICE.

In consequence of general reduced supplies of paper, as the result of prohibition of the importation of much wood pulp and grass, a smaller space will be available until further notice for replies to correspondents.

Moreover, we will answer by post if stamped and addressed envelope is enclosed for reply: 5-cent. International Coupon, from readers abroad.

The full questions and answers will be printed only in the case of inquiries of general interest.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

E. W. AND A. D.—We are much obliged to you for your communication, which you will seen we are using.

G. A.—None, except that if you do not trade in your own name it is necessary to register the business. Particulars of registration you can get from the Registrar of Business Names, 59, Russell Square, London, W.C. 1.

A. H.—You can obtain hydrofluoric acid from Messrs. Johnsons, Ltd., 23, Cross Street, Finsbury, E.C. The price of the commercial acid is about 1s. per pound, 2s. or 3s. per pound for purer varieties. The acid has to be sent in a gutta-percha bottle.

A. A.—You should do very well with the two windows for all but standing figures: for these we should advise, say, three 1,000 c.p. half-watts to give a top light. If the lamps are made adjustable in height you could also use them for evening work.

G. H.—We believe the best terms of insurance are obtainable by members of the Professional Photographers' Association, by arrangement made with the latter, by the Eagle, Star, and British Dominions Company, although we have no information as to the precise rate. You should apply to the Secretary, Professional Photographers' Association, 89, Albany Street, London, N.W.

H. W. H.—The book you want is the "Portrait Studio," issued by our publishers, price 10d., post free. We presume you mean cabinet full-lengths and busts, in which case the longest focus you can use for full-lengths is 8½ ins., or 10½ ins. for busts. These foci are given on the assumption that you have altogether 18 ft. of room, say, 3 ft. for the sitter and background and 3 ft. for the camera and operator.

E. V.—All the plate and paper manufacturers are regular buyers of attractive child studies for specimen cards. Apart from them, other buyers are the postcard publishers, such as the Rotary Photographic Company, West Drayton, Middlesex; Philip G. Hunt and Co., 332, Balham High Road, London, S.W. 17; and Lilywhite, Ltd., Dunkirk Mills, Halifax. These firms usually only buy in sets of six.

A. E.—For such subjects as furniture the lighting must be more even, and the lamps may be more directly over the articles than for portraitore. Still, 5 ft. seems to be too near the background. As length of exposure is of no account, only as many lamps as are required need be lighted; there should be a separate switch for each. If there is a white ceiling above the reflected light, it will help greatly in softening the shadows.

G. L.—The single metal slides were previously almost exclusively a German specialty. We do not know what firms here have been making slides during the war, but we should imagine that the Houghton-Butcher Manufacturing Company, Clifford Road, Walthamstow, London, E.17, is the only one which is likely to have taken up the matter. You might, however, also try a firm in your town, Messrs. Hassler and Sons, 94, Bridge Street, West.

G. F.—We should certainly advise you to put the glass roof and side windows at the south end of your proposed studio, that is to have the background at the house end. You will thus not only avoid the sun, but get better lighting. Also, if possible, make the

roof 10 ft. long, the same as the side light. This need not go right across the roof, 7 ft. will be enough. This will save blinds and the cost of glass. In the side light there is no need to have glass lower than 3 ft. from the floor.

A. H.—We do not think for a minute it would pay you to tinker with the bromide paper in the way of "renovating" it with such solutions as weak bichromate or permanganate. Although it is possible to make the paper clean working by such means, it slows down the emulsion to something like the speed of a gaslight paper. Probably the best thing you can do with it is to burn it and send the ashes to a firm of refiners, such as Messrs. Johnson and Sons, 23, Cross Street, Finsbury, London, E.C.

B. G.—1. The 3C. lens will not be so satisfactory for groups when used at *f*/8 as an ordinary *f*/8 R.R. 2. Very doubtful. There is so little depth with an *f*/2.2 lens that enlargements will suffer from this cause. We think that you are exceeding the useful maximum of aperture in choosing one so large as *f*/2.2. We should say that the very largest aperture which is really useful is *f*/3 and, better, *f*/4. 3. We do not know anything of the chromatic correction of the C3, but as these lenses cover a comparatively narrow angle we should imagine that the corrections over that angle are of a high order.

J. W.—We are unable to diagnose with any certainty the cause of the markings on the postcard negatives. The best suggestion that we can make is that one marking appears to be due to some slight reflection in the camera, say, from some minute polished metal surface in the near neighbourhood of the plate. The light band across the negative of the three ships might, perhaps, be due to some desensitising action from a hinge of a dark-slide, but this is only conjecture. An expert retoucher could very easily take out what appears to be the drying mark in the seascape negative, or the plate might be coated on the back with ground-glass varnish or "Bildup" and worked up with a pencil or crayon.

J. B.—Certainly some people do not suffer at all from developer poisoning. There is no difference, for practical purposes, between M.Q. and amidol as regards production of stress marks. There is, perhaps, a slight advantage in using amidol for prints to be toned by hypo-alum or sulphide in comparison with M.Q., but the difference is very slight. We do not know that iodide improves the tone when added to the bleaching bath. Discoloration of the whites is usually caused by over-exposure and insufficient development of the black prints, but there is always a certain amount of degradation. You should use isochromatic plates, say, of about 100 to 150 H. and D., with a K2 filter. We should prefer pyro-soda to pyro-metol.

E. W.—The ordinary half-watt lamps are not suitable on account of the size of the filament area. No doubt very shortly the focus type of lamp will be again available from the General Electric Company, 67, Queen Victoria Street, London, E.C. But we should think you would have no difficulty in using the enclosed arc lamp made by the Westminster Engineering Co., Victoria Road, Willesden Junction, N.W. We have not heard that there has been any difficulty in getting carbons for these lamps, and the power of a small lamp costing about 50s. is sufficient for all ordinary enlarging. The chemical focus difficulty does arise with some few lenses of the modern type, but the R. R. is almost invariably free from it.

H. P.—1. We should say that the light of the lamp has not been sufficiently diffused with a white reflector. The means of illumination described by "Practicus" is quite sufficient for negatives of much larger size than yours. You may, perhaps, be sufficiently interested to refer to the "B.J." of March 30, 1917, on page 160 of which is described a similar enlarging arrangement used by Mr. Marshall, of Henley-on-Thames. The drawings in this issue will give you some idea as to arranging the lamp and reflecting screen. Certainly you can use a condenser-enlarger, of which we believe Billcliff's is a very suitable one for the purpose. 2. For making negatives 1½ by 2 ins. a 5-in. Cooke *f*/3.5 would be excellent, although many cheap studios use a 7-in. or 8-in. lens, if space permits, on account of the better "drawing," but depth of focus is then very much less.

J. C.—We should think that in your circumstances your best plan would be to use either one of the high-power focus half-watt lamps in conjunction with a condenser or a battery of filament lamps, half-watt or otherwise, in a reflecting-box, so as to provide intense diffused illumination of the negative after the manner of the enlarging cabinet sold by Messrs. Marion. Either of these plans would be convenient and satisfactory with alternating current, whereas even with a good arc-lamp alternating current is the cause of a good deal of trouble. Judging from your sketch the diffused light arrangement would probably be the better since no attention would be wanted in the way of adjusting the illumination on the easel once the lamps have been switched on, whilst with a focus lamp and a condenser there would be the constant need to alter the position of the lamp for different scales of enlargement.

Half-watt Lamps.—Will you kindly advise me with regard to the lighting (electric) of new studio? The place is very low, only 8 ft. to ceiling. If I get three 1,500-watt lamps and use *reflected* light only, shall I be able to obtain good results, or would you advise *direct* diffused light? I realise the difficulty will be with standing figures. I can, perhaps, let the top part of lamps up into the ceiling about 10 ins. The size of room is 32 ft. by 14 ft., and is in all other respects most convenient and desirable. Do you consider the lowness of ceiling a serious difficulty?—R. S.

If reflected light only is used the lighting will be rather flat, but it will answer to give top light for standing figures. We should fix one lamp in this way so as to give a light to fall at about 45 deg. on the head; one a little lower, say 2 ft. to one side; and one lower still, a couple of feet nearer the background, to give a side light. All the lamps should have calico diffusers. You must consider this as a suggestion only, as the position is rather difficult.

T. G.—Depending on particular circumstances, we should say that the balance of advantage is with tank development, on account of the saving of labour and the uniformity of results. You would have no difficulty in accommodating yourself to it, the chief items being proper regard to the temperature of the contents of the tank. The developer should be moved in relation to the plates three or four times during, say, twenty minutes' development, either by lifting the rack of plates up and down, or, in the case of a water-tight tank, turning the tank up on the other end. We should say the cost of chemicals is about the same, perhaps a very little more. Teak tanks are excellent if care is used to prevent them being exposed to conditions in which they will warp, say, by putting them damp out in hot sun. One of the best we have seen is that just introduced by Messrs. Brodrick and advertised in last week's "B.J." The tank is fired enamel, and the rack is of teak. As regards the iodide, we have never heard that there is any advantage in adding it to the sulphide bath—in fact, this addition is quite new to us.

The British Journal of Photography.

The Oldest Photographic Journal in the World.

PUBLISHED EVERY FRIDAY. Established 1854. **PRICE TWOPENCE**

TERMS OF SUBSCRIPTION, POST FREE.

United Kingdom.—One Year, 10s. 10d.; Six Months, 5s. 5d. Three Months, 2s. 9d.

Canada	*One Year.*
Australia	
New Zealand	Thirteen shillings (13s.), or 3 dollars 17 cents, or 16 francs 38 cents, or 9 rupees 12 annas, or 6 yens 30 sens.
South Africa	
United States of America	
South America	
India and Far East	
Continent of Europe ...	

Federated Malay States, Borneo and Sarawak { 5 dollars 57 cents.

Henry Greenwood & Co., Ltd., Proprietors and Publishers, 24, Wellington Street, London, W.C.2.

IMPORTANT NOTICE TO READERS.—Until further notice agents will supply the "B. J." to order only, as the high price prevailing for everything in connection with newspaper production prohibit the distribution of surplus copies for chance sales. It is therefore necessary in order to ensure the regular delivery of the "B. J." each week to place an order definitely with a dealer, newsagent or bookstall clerk, or to send a subscription to the publishers.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3076. Vol. LXVI. FRIDAY, APRIL 18, 1919. Price Twopence.

Contents.

	Page
Ex-Cathedra	197
The Fixation of Bromide Prints	198
Practicus in the Studio. By Practicus	200
Processes for the Reversal of a Negative or Positive Image	201
Bromide Printing, Past and Present. By C. Brangwin Barnes	204
The Fixing and Washing of Prints. By George F. Stine	205
Assistants' Notes	206
Exhibitions	207
Forthcoming Exhibitions	207
Patent News	208
Analecta	208
Meetings of Societies	209
News and Notes	210
Correspondence—	
The Secretaryship of the Professional Photographers' Association	210
British and German Lenses	210
A Complaint of Advertisers	210
Aerial Photography in the War	211
Answers to Correspondents	211

SUMMARY.

It is announced that the honorary secretaryship of the Professional Photographers' Association has been accepted for a period of twelve months by Mr. S. H. Fry, who is also the treasurer of the P.P.A. (P. 210.)

Through the efforts of the Edinburgh Society of Professional Photographers, a class for retouchers is being held at the Edinburgh College of Arts. The President of the Edinburgh Society, Mr. Drummond Young, will be the teacher. (P. 209.)

The question of the importation of German cameras into this country, under the circumstances described last week, was the subject of an inquiry in the House of Commons by Colonel Moore-Brabazon. (P. 199.)

A contributor to "Assistants' Notes" discusses the present position of women—and, therefore, of men—as photographic assistants. (P. 205.)

In a contributed article Mr. C. Brangwin Barnes deals with a number of the practical matters concerned in the quantity production of bromide prints. (P. 204.)

We reprint from the "Photo-Era" a paper on the fixing and washing of prints, in which the writer, Mr. G. F. Stine, advocates the plan of deciding when a fixing-bath has become exhausted by noting the area of paper which has been treated. (P. 205.)

In a leading article on the fixation of bromide prints we give our reasons for dissenting from this recommendation and from one or two others of the views expressed by Mr. Stine. We deal with the practice which requires to be followed in the handling of large quantities of bromide prints according to the means adopted for arresting development. (P. 193.)

The many methods of chemical reversal—that is to say, the conversion of a negative image (latent or developed) into a positive one, or *vice versâ*—are the subject of a review, from which will be seen the different chemical expedients which have been adopted. The usefulness of these processes lies in such work as the making of an enlarged negative direct from a smaller one, or the production, without the intermediary of a negative, of positive lantern slides from book illustrations, etc. (P. 201.)

In his article this week "Practicus" deals with a number of the points concerned in the making of copies of customers' originals in the ordinary routine of a studio business. His notes emphasise the necessity of a permanent little outfit for the purpose, the choice of plates, correct exposure, and the most advisable description of lighting. (P. 200.)

The Zeiss factory at Mill Hill has now passed into the hands of a group of spectacle-making firms. (P. 199.)

Two exhibitions are now open in London, one of carbon and Ozobrome photographs at the Camera Club, John Street, Adelphi, and the other of photographs by the Royal Air Force at the Grafton Galleries. (P. 207.)

EX CATHEDRA.

Pince-nez and Portraiture. In the case of sitters who wear glasses it is necessary to pay great attention to the lighting, for if this is not done the glasses may reflect the light or objects in the studio without rendering the eyes of the sitter at all. A too strong top light will often produce this effect, which should be carefully looked for when focussing. A slight modification of the blinds or poise of the sitter's head may eliminate this unpleasant effect altogether. It is absolutely essential that well-backed plates or a film be used for this class of work, or trouble is almost certain to be caused by halation, which even if it does not ruin the negative entirely will necessitate a lot of retouching. We can recall a case where gold-rimmed pince-nez gave trouble in this respect. In fact, the rims of the glasses may easily give more trouble than the latter, with the exception of their reflecting powers mentioned above. It is sometimes possible to dispense with the glasses if the sitter has an old frame from which these have been removed, but such a plan is not always possible, as in the case of a sitter who has to wear glasses in order to correct a cast of the eyes.

* * *

Dogs in Portraits. It sometimes happens that a photographer is asked to include in a portrait the sitter's favourite dog. There is no doubt that, if well done, the inclusion of a dog in a portrait of a dog lover is bound to add an intrinsic value to the picture. Moreover, a good specimen should also prove a good advertisement of the skill of the photographer, bringing large orders for prints or enlargements, as well as an incentive to other dog lovers to be photographed in the same manner. This class of portrait work ought not to be regarded as presenting great difficulties, provided one is blessed with a good lighting and rapid lenses and plates. A further point may be noted. The dog of a genuine dog lover is pretty certain to be docile and well trained, and, if this is the case, the photographer's difficulties vanish; it only remains to get the best pose from both sitter and dog. If the photographer also has a really sympathetic understanding of the canine species, he will readily know what means to adopt for the purpose of attracting the best in the animal at the moment of exposure. It is not wise, unless the dog is known, to attempt to attract its attention by means of whistles, etc. We know of one case where the photographer, after having focussed both sitter and animal, endeavoured to secure the latter's attention by shuffling his feet vigorously. The result was that the dog, having seen the same procedure adopted by tramps, against whom he waged unending war, misunderstood the action, and, leaping forward, fastened his teeth smartly in the photographer's leg. An incident of this kind points to the wisdom of letting the animal to a great extent pose itself, which it will do if given time, instead of trying to force the desirable result by adopting means the result of which are uncertain.

Photographs of Motor-cars. Possibly no industry uses photographic illustrations for advertising purposes as does that of the motor, and with the exception of the aeroplane none offers a better future for the commercial photographer: as with other branches of commercial work, a certain knowledge of the technique of the particular industry is a great advantage to the photographers, who should be able to appreciate ideals of construction and design and to put these points forcibly in the treatment of the photographs. A set of photographs taken to illustrate the desirable qualities of a car requires to show the arrangement of its seating, *i.e.*, its comfort for the passengers, the graceful and artistic lines of its design, and also the car speeding along a stretch of country road. Such a picture as this last, with its story of the delights of speed, goes far to making the purchasing public know and appreciate that particular model. There are still other ways in which the manufacturers might learn to rely upon the commercial photographers instead of on the draughtsmen. Details of engines, gears, universal joints, friction drives, the build of the chassis, and all the other miscellania of the motor-car are quite easy to photograph, provided the photographer and maker work hand in hand. But such work cannot often be done in a studio, though even then nothing ought to prevent the production of satisfactory pictures. In our opinion many commercial operators rely too much on "blocking out," when a few sheets of white paper or other light material will often suffice to isolate elements of the picture from their unwanted surroundings. Many details of a car are readily amenable to this treatment, which, in any event, simplifies the work of blocking-out in cases where it is necessary.

* * *

A Card Index. Slack times occur in nearly every business, and they cannot be filled up in a better way than by making an effort to secure additional trade. It is, however, somewhat difficult to do this without some jumping-off point, which will prevent one from saying, "I want to do something, but how on earth can I do it." There can be no doubt that in photography there is no better way of advertising than through the post, and that by letter rather than by circular. The important point in starting on this work is to have a list of people to whom a direct appeal can be made with some prospect of success, though too much must not be hoped for at the beginning. It is a good plan to keep a special card index of possible customers for the sole purpose of advertising, apart from any order which may have been given previously. It need not be a large one, for the names should be carefully selected and annotated with any information which may be useful. It should contain, first, the names of customers who have given orders during any period which may have been decided upon, and the names of prominent residents whose patronage would be desirable. In every case where there is any possible excuse for making a personal reference an original letter should be written, embodying a specific suggestion, such, for example, that especially advantageous arrangements have been made for the production of coloured miniatures, or that a new style of printing, mounting, or enlarging has just been introduced, and that prints from the existing negatives can be supplied in these styles. Sometimes it will be worth enclosing a small print to indicate the class of work which is being offered. In the case of those not already customers a general letter inviting inspection of a collection of new styles may be sent. Above all, the appearance of a circular must be avoided, even to the exclusion of carbon copies. It is now possible to obtain copies made showing the texture of the typewriter ribbon, and these should each be signed in ink in the way usual with other business letters. The notes on the cards should indicate the class of work to be offered, say, to elderly people or their families, an announcement of readiness to take portraits at the sitter's own home; to parents of babies, particulars of miniatures and enlargements; to bridal sitters, anything relating to new styles, with a reference to the possibilities of utilising portions of groups, etc., already taken. It does not matter whether any order results in the particular line suggested, the object being to find an excuse for bringing the photographer's name before customers from time to time, not as an ordinary advertisement, but as a personal matter.

THE FIXATION OF BROMIDE PRINTS.

The article by Mr. G. F. Stine, which we reprint from an American contemporary, raises certain points in connection with the fixation of development prints on which we think it is necessary to make some comment. For while the author very properly dwells upon the importance of complete fixing and thorough washing there are certain of his recommendations which in our view are not in correspondence with the most advisable practice. To begin with—and it is a point which lies at the root of the proper handling of development prints—we do not agree that the greater number of cases of discoloration and fading in prints are due to imperfect washing. On the other hand, and it is here that we disagree with Mr. Stine, we think that both experience and theoretical considerations prove that the fault lies in want of thorough fixation. It is common knowledge that a print which has been thoroughly fixed can be given the scantiest washing without afterwards suffering any ill effects, whereas no amount of washing will remedy the state of things which is the result of incomplete fixation. In our view, too great insistence cannot be laid on the relative importance of the two operations. If fixation is thorough—and thorough fixation is not such a simple process as many photographers think it is—then the subsequent process of washing contains very little danger for the permanence of the print, even should it be improperly carried out.

Then, again, we are not altogether in agreement with Mr. Stine in the preference which he expresses for the acid hardening-fixing bath in comparison with one of plain hypo. There is no doubt whatever that a solution containing nothing but hypo dissolved in it is the best fixing bath for prints, and should be used whenever the working conditions allow of it. There may be good commercial reasons for using a bath containing other chemicals, but, speaking broadly, the average permanence of prints turned out from a studio will be greater in proportion as a plain hypo bath is used for fixing, with the important proviso that no other bath is employed which can affect the chemical composition of the hypo solution. And this is a point which brings us directly in touch with the difficulties which apparently present themselves to many photographers in their choice of the best working practice which they should adopt. Obviously a system which is sufficient for the amateur who is making only a dozen or two prints, and those of small size, at a time will not answer the purpose of the photographer who is handling hundreds, and who very frequently is working on such larger scale of numbers with prints of much greater size. Thus it is usually necessary that the person who is developing the prints should have nothing to do with fixing them, or at any rate should postpone handling them in the fixing bath until the whole batch has been developed. If an assistant is available to deal with the prints in the fixer as fast as they are developed the problem is simplified; but many photographers are under the

necessity of working single-handed, and therefore require to make their practice that which will have the least drawback as regards regularity of the prints and their permanence. The plans which thus present themselves are: (1) Passing prints straight into the hypo bath; (2) passing into a water bath, with or without running water; and (3) passing prints into a so-called stop bath. We can dismiss the first plan as impracticable except in the case of quite small prints which can be immersed in the fixer and subsequently moved about by means of a print paddle. The second plan, arresting development in a water bath, requires that a large bulk of water should be used or that there should be a brisk stream of water passing through the tank, otherwise development will go on and the prints will be irregular in depth. The third plan is to use a stop bath of weak acid or some such acid salt as potassium metabisulphite or sodium bisulphite. Any weak acid bath will arrest development immediately, and will go on doing it until the alkali transferred from the developer has neutralised the acid.

Now, these three systems impose different demands as to the composition of the fixing bath. If one transfers prints directly, without washing or stop bath, to a plain hypo solution the latter becomes discoloured from oxidised developer very much more quickly than an acid hardening-fixing bath. Although this may seem to represent a waste of hypo we are not so sure but that it has a good deal to recommend it, for the progressive discoloration of the bath is a species of danger signal, showing that a considerable number of prints have passed through it. The user will be led to discard it as soon as he judges that there is a danger of staining of the prints, and in doing that he is at the same time removing the possibility of employing a bath which has become too exhausted for satisfactory fixation. The plan may be, and very likely is, wasteful of hypo, for it may be assumed that the discoloration moves ahead of the using-up of the hypo.

To come now to the plan of washing prints between development and fixing, discoloration of a plain hypo bath is then very largely avoided, and caution requires to be used in the direction of not keeping the fixer in use until the hypo has been used up beyond the point of effectiveness. We refer to this matter in a later paragraph. It is, of course, immaterial when prints are washed in water, whether the fixer be one of plain hypo or of the acid hardening-fixing type. On the other hand, in the case of using an acid short-stop for arresting the progress of development the nature of the weak acid bath makes a very great difference. In the old days when an acid bath (of acetic acid) had to be used with the iron developer it was necessary, and the invariable practice, to wash prints in several changes of water before fixing them. If this is not done the acid and hypo form a mixture which soon contains compounds which will give rise to brownish after-stains on the prints. These ill-effects will, of course, follow the use of such acid bath under these conditions when a modern developer is used unless the prints are washed after the acid bath. To avoid them the acid bath must be one of a kind which does not exert this decomposing action on hypo, or else substances must be added to the hypo bath itself to counteract the acid brought into it by the prints. Of these two alternatives the former is certainly the better, and consists in the use of a stop bath of what is actually free sulphurous acid, conveniently used in the form of soda bisulphite or metabisulphite. If, on the other hand, a stronger acid such as acetic or citric be used, then the hypo bath should on no account be one of plain hypo, but should contain also a fair proportion of sulphite (which will render the entering acid innocuous) or may be one of the acid hardening-fixing type which likewise contains sulphite for this purpose.

Another matter in which our own inclinations depart from those of Mr. Stine is the method suggested by him for gauging when hypo solution has been used for as much paper as it should be used for. Mr. Stine recommends the plan of passing through prints in such number that approximately 5,300 square inches of paper is supplied with 16 ounces of hypo, made up according to a particular acid hardening-fixing formula. Our objection to this suggestion is, first, that papers vary in the quantity of silver bromide contained per unit area; and, second, that such a plan disregards any loss of fixing power which the bath may sustain as a result of low temperature. In many places the fixer is by no means at the temperature of, say, 65 degrees which it should have, and any calculations based on what it should do at a normal temperature would be falsified in practice. As we have many time suggested, we think that the best test of the progress of a bath in use for fixing is to immerse in it a slip of undeveloped dry-plate and to note the time which is taken for the emulsion film to become clear. If this is more than five minutes the bath may be put aside as sufficiently exhausted for the purpose of fixing prints to be discarded. It need not, however, be wasted, since it can still be used for fixing negatives where the progress of the process can be seen. Further, we should not finish these notes without insisting, as we have done many times before, on the advantage of passing prints through two fixing baths in succession. Whether the bath is of the plain or hardening-fixing type there is a very much greater assurance of permanence if this plan be followed. Bath No. 1 should be kept in use until its removal is indicated by the test mentioned above; No. 2, which obviously has been very little taxed, should then take its place until it (No. 2) reaches the same stage, a new lot of bath being supplied for the fresh No. 2. Such a method as this is applicable upon both the largest as well as the smallest scale, and it is one which if religiously carried out will remove the complaints of stains or markings which arise from imperfect fixation.

THE GERMAN CAMERAS.—In the House of Commons, last week, Lieut.-Colonel Moore-Brabazon (Co. U., Chatham) asked the Secretary for War whether he was aware of the purchase of optical and photographic goods in Germany, and the importing of them as personal luggage into this country for re-sale by many officers, and, as trading with the enemy was still illegal, whether he would issue further orders to troops on this matter or have their baggage searched, in view of the fact that the legitimate trader was seriously handicapped by the growth of this practice?

Mr. Churchill replied that he is not aware of this, but if details of the specific cases were supplied to him, with evidence that the practice is widespread, he would consider the desirability of instituting inquiries into the matter.

THE ZEISS FACTORY.—We learn that the optical factory erected by Messrs. Zeiss on the summit of Pittacy Hill, Mill Hill, in 1910, has been acquired by a group of British spectacle-making firms, of whom Messrs. George Culver is one. The company now being formed to manufacture these goods upon a large scale looks forward to employing hundreds of workpeople in the factory and to reversing the large proportion of spectacle lenses imported into this country from Germany before the war. The factory, which is one of four floors, measuring 150 ft. by 40 ft., has been purchased from Messrs. Ross, who acquired it together with the other premises and assets of the Zeiss firm some two years ago. During the later stages of the war it had been used by them for the manufacture of prismatic field glasses.

PRACTICUS IN THE STUDIO.

[Previous articles of this series, in which the aim of the writer is to communicate items of a long experience in studio portraiture, have appeared weekly since the beginning of the present year. It is not thought possible to continue the series to the length of that by the same writer which ran through the "British Journal" some years ago, but if any reader among the younger generation of photographers, and particularly those engaged as assistants, has a particular subject which might be dealt with, his or her suggestion will be welcomed. The subjects of the previous articles of the series have been as follows :—

A Talk About Lighting (Jan. 3).
The Camera and the Lens (Jan. 10).
Managing the Sitter (Jan. 17).
Backgrounds (Jan. 24).
Studio Exposures (Jan. 31).
Artificial Lighting (Feb. 7).
Printing Processes for Portraiture (Feb. 14).
Studio Accessories and Furniture (Feb. 21).
The Surroundings of the Studio (Feb. 28).
Studio Heating and Ventilation (March 7).
The Postcard Studio (March 14).
The Printing-Room (March 21).
About the Reception Room (March 28).
Home Portraiture (April 4).
Portable Studios (April 11).

COPYING.

The reproduction of pictures, especially old photographs, miniatures and Daguerreotypes, if properly done, is an important and lucrative branch of the business, especially in studios having a "family" connection. I am sorry to say that all photographers do not think so and therefore do not trouble themselves to do the work properly; as a consequence the jobs do not turn out well, the photographer does not feel justified in charging a decent price, and the customer is not satisfied. He does not always blame the photographer, but concludes that a satisfactory copy cannot be made, and lets it go at that.

The first mistake that most photographers make is to charge less for a copy than for an ordinary sitting. In my experience a copy takes more time in every process than a sitting, and therefore the charge if anything should be greater, at all events not less. The average operator, whether he be proprietor or employee, usually looks on copies as a nuisance to be knocked off at any slack time and then generally after the time promised for delivery, while any special arrangements for doing the work are in many cases conspicuous by their absence. It is a common thing to find an operator copying a c.d.v. pinned on the edge of a background, using the ordinary studio camera and lens. Copies of a sort can be made this way, some quite good, but there is a great loss of time in getting the proper size and in keeping the print and plate parallel. I have seen many a negative made thus in which the image was badly out of shape, instead of rectangular, and only when the print was trimmed was it presentable.

Much time will be saved and better copies turned out if a special apparatus is kept ready for use, and there are few studios so poorly equipped that a camera cannot be found for this purpose. If a camera cannot be spared, at least a pair of runners and a copying board can be arranged so that the studio camera can be used, and if this is a fixture upon its stand the runners and board can be attached to that, in the very simple way invented many years ago by Mr. A. Cowan.

But the copying apparatus is best arranged on a long narrow table which has two strong rails screwed down upon the top. On these slide a platform to carry the camera and the easel upon which the original is fixed. The idea has been carried out in a very neat way in the Southport enlarging table, which is equally adapted for artificial light enlarging or ordinary copying. In this model the easel can be raised and lowered and turned on a pivot so that the image can be quickly got into correct position on the ground glass. It is, however, open to anyone to make a somewhat similar arrangement on as simple lines as may be desired. I would rather work with a couple of slate battens and two grocers' boxes, than fumble about with no proper means of keeping things square.

The camera may be of the simplest type, but it must have fairly long extension; about three times the longest side of the plate to be used is a useful length. Rising and cross fronts are desirable, as they save moving the original, but a swing-back is unnecessary and even undesirable. A camera which has insufficient extension may be lengthened by the addition of a wooden box or cone; if carefully used, a cardboard extension will answer very well.

The lens should be a non-distorting one, and as an aperture of $f/16$ is large enough for almost all work an expensive instrument is not needed. Any fairly good rapid or wide-angle rectilinear or one of the old triplets of Dallmeyer or Ross or the doublets of the latter maker will all be found satisfactory. Of course, if a modern anastigmat is available, by all means use it, but such good lenses are rarely needed in ordinary studio copying. I have at a pinch used the single lens of a very small Kodak when my bellows extension was not long enough to give the desired magnification with any other lens, and found it quite satisfactory when stopped down.

As a guide to the necessary camera extension for any particular lens, I will venture to repeat the formula for finding the conjugate foci; everyone is supposed to know it, but few remember it when needed. Briefly it is as follows. The distance between lens and original when reducing is the focal length of the lens multiplied by the degree of reduction plus one focal length. The distance between lens and plate is the focal length divided by the degree of reduction plus one focal length of the lens. As an example, reduction to one-third scale when using a nine-inch lens requires four times nine inches or three feet from lens to original and three inches plus nine inches, or one foot from lens to plate. These measurements would be, of course, reversed if we were making a copy three times the scale of the original. By applying the same rule we find that for a copy the exact size of the original we require double the focal length of the lens in use both before and behind it. Much time may be saved by marking the positions for full size, half-scale, double-scale, and any other desired sizes upon the runners of the copying table.

It is useless to expect the best possible results if only plates of portrait rapidity are available. Excellent negatives can often be obtained from good originals, but it is much easier to work with "ordinary" plates for the majority of originals, while "process" plates should always be used for line subjects and very flat and faded silver prints. Some people imagine that orthochromatic plates, with a blue or a yellow filter, are needed for the latter class of subject, but after careful trial I vote in favour of the "process" variety. These have also the great advantage that they can be more easily intensified than ordinary or rapid plates. I am not at all unmindful of the necessity for using orthochromatic or even panchromatic plates for many classes of original, and in most cases the use of a colour screen is a great advantage, if not a necessity. For one thing it minimises the grain, especially

with deep brown or yellowish originals, and it is indispensable with coloured originals, especially when there are blue draperies. Much is claimed for self-screened plates, but for difficult subjects they are not to be compared with an ordinary ortho' plate and a suitable filter. I need hardly say that the filters should be of the modern dyed gelatine type, the old brownish yellow-glass giving very little correction while enormously increasing the exposure.

The exposure of copy negatives calls for a considerable amount of skill, and only those who are constantly engaged on this class of work can make certain of getting the time accurate, yet this is the crux of the whole thing. Much may be learned by making a few strip tests upon various subjects, making a note of the exposure which is judged to be correct, and noting also the time taken to match the tint in an ordinary Bee Exposure meter. At any subsequent time the correct exposure can be found by taking the meter time again and increasing or decreasing the previously noted exposure accordingly. Perhaps an example will help to explain what I mean. Suppose we take an ordinary cabinet print and we find by means of our strip test that with a certain lens aperture and plate, one minute is needed to give a good negative the same size as the original. We find also that the Bee meter exposed to the same light takes ten minutes to match the tint. Then at a later date, wishing to do a similar job, we again use the Bee meter and find that it takes fifteen minutes to reach the tint. This means that we must increase our exposure in like ratio and give a minute and a-half. The colour of the original is an important factor, and more especially the colour of the paper itself. If we have two bromides, one on pure white paper and one on cream toned base, the latter will require at least twice the exposure of the former upon an ordinary plate. In like manner a sepia toned print will need much longer exposure than a black and white if we are to get satisfactory rendering of the half-tones, especially in the shadows.

The lighting of the original should in nearly all cases be strong and direct; very flat and diffused lighting gives flat negatives. We may here take a lesson from the photo-engraver who uses a couple of powerful enclosed arc lamps, one on either side of his copy-board. This not only gives even illumination but minimises any tendency to show the granular texture of the original. For small work a couple of good upright incandescent gas burners will make a very satisfactory illuminant, or a couple of the new small half-watt lamps. The ordinary carbon and metallic-filament lamps give two yellow a light to be good for copying except with ortho plates.

If the exposure be reasonably correct copy negatives require no special care in development, and the developer used for other work will do, with the addition of a little bromide solution. If the progress of development be judged by inspection it is necessary to remember that a copy always starts fairly evenly all over, and to the inexperienced eye would appear to be over-exposed. This should be disregarded and development carried on for the full time, when a bright negative should result.

Great care should be taken of customers' originals, not only with regard to stains and finger-marks, but in the matter of fixing upon the copy board. Never stick a pin through a print or mount which does not belong to you. If drawing pins or push-pins are used the print should be held under the head of the pin and not by the point. Unmounted prints are best copied in a printing frame with a plate-glass front and strong springs, and this is useful also for many very small originals such as prints out of lockets, small ivories and the like, which will not bear having even the slightest part covered up. On no account wet a print or tamper with it in any way without the consent of the owner. For example, an unmounted snapshot which has been carried about and become creased should be dry-mounted before copying, but permission should always be asked.

PRACTICUS.

PROCESSES FOR THE REVERSAL OF A NEGATIVE OR POSITIVE IMAGE.

I.

In many distinct branches of photographic work there is the occasion for the reversal in the same sensitive film of the image, either latent or developed, produced by light. For example, where a number of lantern slides require to be made from drawings or diagrams in books, and only one slide of each is wanted, there is obviously an economy of material if it is possible to produce upon the lantern plate not a negative but a positive of satisfactory quality. In the making of copies, as is now very largely done in installations, such as the Photostat, there is a preference for a positive copy, although the great majority of such copies are negatives, that is to say, in white lines on a dark ground; and a positive, when it is supplied, is usually made by re-copying the negative copy. Another application of the same principle is in the making of an enlarged negative, on a dry-plate or bromide paper, direct from a small one without the intermediary production of a positive transparency. In certain photo-mechanical processes there is likewise a similar demand, as there is also in the business of while-you-wait portraiture. Some few years ago a paper specially manufactured in order to yield a single positive portrait by exposure in the camera was placed on the market, and though it yielded excellent results by a very rapid method of manipulation, did not obtain any substantial market, apparently not from any defect in the material, but from reconstruction of the American firm by which it was made. On these several accounts there is thus some considerable interest in the processes which have been suggested or worked at one time or another for producing results of this kind, and of which one class is those which obtain by direct development a positive instead of a negative image where a plate or paper is exposed to a subject in the camera, or, on the other hand, a negative instead of a positive image when the material is exposed on an enlarger easel on to which the image of a negative is projected. The second class of process, and by far the greater, is that in which an image is developed in the first instance, and is then dissolved by some solvent of metallic silver, the residual emulsion then being caused to form what may be called a complementary image, that is to say, positive if the original image was negative and *vice versa*.

The second type of process is one which within the last few years has become familiar from the fact of its use in the Autochrome process, where the original negative image is dissolved by means of the solution of permanganate and acid, and the remaining emulsion, after exposure to light, developed to form a positive. But processes of this kind are of very much older date than the Autochrome process, and include within themselves a considerable number of variations of the same principle. For example, a method, brief instructions for which we have given for many years past in the Almanac, consists in removing the first developed image with a 2 per cent. solu-

tion of ammonium persulphate, afterwards re-developing the remaining emulsion with a developer containing a fair amount of bromide. This is a process which we have frequently used in the past for making a duplicate negative directly, although, of course, when the plate is printed by contact the reproduced negative is reversed as regards right and left, and if printed in the ordinary way yields reversed prints.

In all processes of this kind the differences consist chiefly in the means adopted for removing the first developed image. One of the earliest processes is that of M. Coustet, published in 1905, in which the image is removed by hydrogen peroxide prepared by making up a solution as follows:—

Water	1,000 c.c.s.
Hydrochloric acid	100 c.c.s.
Barium peroxide	50 gms.

This solution, on a negative being immersed in it, dissolves not only the silver image but the gelatine holding it, yielding a plate which bears an image composed of various thicknesses of gelatine and unaltered silver haloid. M. Coustet dissolved out the haloid with hypo, and obtained his reversed image by dyeing the gelatine.

In most of the processes, however, the original image is removed with either bichromate or permanganate dissolved in water, with the addition of acid. A formula recommended by Maes ("B.J.," March 20, 1908, p. 215) for the making of enlarged paper negatives directly consists in developing with amidol, washing out the developer, and exposing for a few seconds to daylight or to an incandescent burner for from 30 secs. to a minute at about a foot distance. The print is then placed in a solution:—

Potass bichromate	15 gms.
Nitric acid	6 c.c.s.
Water	500 c.c.s.

The solution dissolves the silver image and converts the silver bromide into silver chromate. After washing for a considerable time or immersion for a few minutes in a solution of soda sulphite and soda bisulphite, the negative print is developed with amidol to sufficient intensity. Using a similar process, C. R. M. Parr ("B.J.," November 8, 1908, p. 846) employed the following solution for removal of the silver image:—

Potass bichromate	75 grs.
Nitric acid	30 mms.
Water	5 ozs.

The print is subsequently passed through a solution of soda sulphite and potassium metabisulphite, re-developed with amidol, fixed and washed.

This process—of dissolving the acid bichromate and re-developing—was worked out very thoroughly by Douglas Carnegie, who, we know, used it regularly for the making of the large number of lantern slides from book illustrations which he constantly required in his work as a University Extension lecturer. The details which he published of the process are contained in two articles in the "British Journal" of October 23, 1908, p. 811, and July 9, 1909, p. 528. The lantern plates were exposed in the camera glass side towards the lens, and developed film up in an M.Q. developer, using sodium carbonate as the accelerator until the image was clearly visible on the film surface. Development occupied about five minutes. The plate was well rinsed for about one minute and flooded with a reversing solution of—

Ammonium bichromate	150 grs.
Nitric acid, concentrated	1½ drs.
Water	20 ozs.

The two or three minutes' immersion sufficed to remove the silver image, after which the plate was rinsed for about one minute, and placed in a black developing dish, to the bottom of which a couple of narrow strips of glass had been cemented so that it could be laid therein film downwards. The previously used developer was poured on, or rather the plate introduced slantingwise into the developer in order to avoid air-bubbles on the surface of the film, the dish rocked for about half a minute, and then about three-quarters of an inch of magnesium ribbon burnt at a vertical height above of it of about three feet. The plate was then left to develop for a further five minutes, fixed in an acid fixing bath and washed. In the case of slides from full-tone negatives a weaker light such as that from a flat-flame gas-burner, was found necessary in order to preserve the tones of the negative. If any fog be left on the slide treatment with Farmer's reducer would remove it without reducing the contrast or vigour of the heavier deposits.

The Carnegie process was tested for its practical usefulness by Dr. D'Arcy Power, whose list of the precautions necessary in working it are as follows ("B.J.," March 17, 1911, p. 194):—1 Expose glass side outwards, so that full development may be obtained without fogging. 2. Develop for greater density than usual in a negative. 3. Wash for from three to five minutes. 4. Turn film side down in a pan of water with a piece of black paper next the film, and remove into full daylight from three to five minutes. 5. Return to dark-room, remove plate, face up, to a bath of ½ per cent. ammonium bichromate acidulated with 1 per cent. nitric acid. In three minutes the image will disappear. 6. Wash in dark-room for fifteen minutes. 7. Re-develop to rather more than required density. 8. Fix in hypo. 9. Should, as is often the case, the surface be soiled by a slight deposit, one much like that on the surface of lots of developing papers, wash over with a little weak Farmer's reducer, and it readily disappears. 10. Wash. The resulting slide should be identical in gradation with the subject. It can be reduced, intensified, or toned like any other lantern-slide.

As regards the exposure to light for re-development, a recommendation of Balagny ("B.J.," August 12, 1910, p. 609) is to make this exposure before dissolving out the primary image on the ground of the silver image protecting the underlying layer of silver bromide and so preventing fog. For protecting the back of the plate during this exposure Balagny squeegees on a non-actinic tissue, then exposing for from one to five minutes in diffused daylight.

Processes in which acid permanganate have been used as the solvent of the first image have been frequently described since the successful employment of this means in the Autochrome process. The very thin film, however, of the Autochrome plate renders reversal a much easier operation than it is with ordinary dry-plates, or even with the more thinly-coated bromide paper. A permanganate formula recommended for Ilford "Smooth Slow" bromide paper by the Rev. F. C. Lamber ("Photographic Scraps," October, 1908, p. 270) is:—

Potash alum saturated solution	2 oz.
Sulphuric acid 20 p.c. solution	1 dr.
Potass permanganate solution	Enough to give the mixture a port wine colour.

The print is developed until the highest light can be fairly seen on the back of the paper, is rinsed, and after treatment in the permanganate bath is passed through a weak solution of oxalic acid to remove any stain. It is then washed for five minutes, laid flat on the bottom of the dish, and exposed to the light of a gas-burner for, say, 30 seconds at one foot. If on re-development no image is produced at the end of minute further exposure is given as required to assist development.

A permanganate formula of G. H. Truman ("The Camera," May, 1910, p. 194) is compounded from a stock bath consisting of 100 grains potass. permanganate in 10 ounces of water

One ounce of this solution is mixed with 10 ounces of water and 1 dram strong sulphuric acid added.

It will be observed that in all these methods a certain nicety is required in exposing the print to light before or after reversal in order to obtain proper re-development of the residual image. A process which dispenses with this uncertainty consists in replacing the re-developer by a solution of sodium sulphide. A method on this basis was worked out by the Eastman Research Laboratory ("B.J.," February 9, 1917, p. 68), apparently in ignorance of the fact that an almost identical process was suggested by W. Morison in "The Bromide Monthly," October, 1908, p. 191. According to Morison, the paper print is developed fully, rinsed in water, and then placed in a bath of chrome alum, after which it is treated in a sulphide solution as used for sepia toning. The sulphide converts the unaltered silver bromide emulsion into silver sulphide, but does not affect the developed silver image. After washing, the developed image is then dissolved out most conveniently by bleaching with a solution of ferricyanide and bromide followed by a hypo bath. The working details of the process published by the Eastman Laboratory differ from those of Morison first as regards the sulphide solution. The latter should be of fair strength, namely, 1 oz. 330 grains of sodium sulphide cryst. dissolved in 32 ounces of water, and preferably with boiling of the solution in order to throw down any iron. The bath should be used at a temperature of 70 degs. F. The solution for the removal of the primary silver image is:—

Potass ferricyanide	11 ozs.
Ammonium sulphocyanide	11 ozs.
Water to	32 ozs.

This very strong bath is applied for from three to four minutes at a temperature from 65 to 75 degs. F., and owing to the solvent action of the sulphocyanide on silver bromide fixes the print as well as removes the silver image.

A process which is something akin to the last one is that of W. L. G. Bennett ("Amateur Photographer," August 24, 1909, p. 181). Here, as in the last-mentioned process, the primary silver image is removed, not by an acid oxidising solution, but by converting it into a compound, which is afterwards easily soluble. Bennett tones the primary silver image in a strong uranium toning bath for five or ten minutes, the object being to convert the silver deposit completely into uranium ferrocyanide. After washing and treatment for one minute in a bath of ammonium sulphocyanide (2 grains per ounce), it is well washed, laid face up in an empty dish, and exposed to the light of an inch or two of magnesium ribbon burnt about two feet distant. It is then re-developed, the alkali of the developer removing the uranium-converted primary image. Obviously the uranium image might be removed with a bath of carbonate of soda, and the residual silver bromide darkened with soda sulphide, thus dispensing with the necessity of exposure to light.

The problem of forming the reversed image from the residual silver bromide is one which has been dealt with in still another way by MM. Lumière and Seyewetz, who, in a paper published in the "B.J.," November 10, 1911, p. 851, record the success attending the dissolving out of the silver bromide that is left and the re-development of the image which remains with a mercury physical developer or rather intensifier. Their process consisted in developing the original image thoroughly for about four times the usual time, and then in full daylight dissolving the image in a permanganate bath of the composition:—

Potass permanganate	1 gm.
Sulphuric acid, strong	10 c.c.s.
Water	1,000 c.c.s.

The negative is rinsed, cleared with a 2 per cent. solution of soda bisulphite lye, and if not perfectly bleached again passed through the permanganate and bisulphite baths. It is then fixed in a 10 per cent. solution of hypo, thoroughly washed, and the image, which through the exposure to light has been rendered susceptible to re-development, brought up in a solution prepared from the two following stock baths:—

A.—Soda sulphite, anhydrous	180 gms.
Mercuric bromide	9 gms.
Water	1,000 c.c.s.
B.—Soda sulphite, anhydrous	20 gms.
Metol	20 gms.
Water	1,000 c.c.s.

Fifteen parts of A are mixed with 4 parts of B, the reversed image developing slowly in the mixture with freedom from fog.

A variation of this method in which the silver image is not dissolved until it has been used as a kind of screen in exposing the residual silver bromide was also described by Lumière and Seyewetz. In the case of this process the plate is fully developed, rinsed for about a minute, and then placed against a dark ground, such as a sheet of black paper, which is pressed on the glass so that light reaches the emulsion only from the film side. The plate at this stage is then exposed to the light of, say, an incandescent burner for about 10 or 15 mins. at a distance of 20 ins., the silver image then dissolved in the permanganate bath given above, this treatment, as also the subsequent operations, being done by the ordinary dark-room light. The plate is passed through a weak bath of sodium bisulphite, rinsed, fixed in 10 per cent. hypo, thoroughly washed, and the image brought up with the mercury intensifier, made according to the above formula. The intensification is a slow process, occupying from one hour to an hour and a-half, but yields an image of very fine detail and of density equal to that of a negative developed by the customary alkaline method.

In all these processes in which an acid solution of permanganate is employed for the solution of the silver image it is an important point that the solvent bath should be free from chlorides, otherwise the image is partly converted into chloride, and on re-development or other subsequent process will be reproduced as deposit, which fogs what should be the high-lights of the new image and produces an effect worse than a general fog. Commercial permanganate often contains chloride impurity, which can be removed by addition of a few drops of silver nitrate solution to the bath.

Royal Photographic Society.—At the meeting of the Society, held on Tuesday, April 8, forty-two members signed their names as members of the newly-formed Scientific and Technical Group.

The Amazing Mutes.—Mr. Ward Muir's most entertaining book of the experiences of the members of a touring association in Switzerland has just been issued in a cheap edition, price 1s. 9d. nett, by Messrs. Simpkin, Marshall. Those who did not take our advice, on the book first appearing, to include it among their stand-bys for a long railway journey, should make a note of the cheaper and more compact edition now issued.

Toning Vitegas Prints.—Messrs. Kosmos Photographics, Limited, Letchworth, Herts, send us an eight-page booklet which they have just published on the toning of prints on their Vitegas paper by the hypo-alum and sulphide methods. They give detailed directions for the making and ripening with silver of the hypo-alum bath, and as regards the ordinary sepia papers state their preference for a bleach formula containing a little ammonia. The booklet will certainly be appreciated by those who have any difficulty in these toning methods. A copy may be had on application to the Kosmos Company.

BROMIDE PRINTING, PAST AND PRESENT.

Those amongst us who can remember the early bromide prints which were boomed as the coming process, by Messrs. Morgan and Laing, must be somewhat astonished to find that the crude efforts of those early days have developed into the results of the present day and have almost as effectually wiped out P.O.P. as P.O.P. wiped out the older albumen paper. The advance of bromide has not been without its effect upon other processes; its similarity to platinotype, together with its cheaper rate of production, has had its effect upon the older process and bromide enlargements have also to a very marked extent taken the place of carbon. Very few professionals, now, but do most of their business in bromide. A comparison between the earlier productions in this process and those of to-day undoubtedly show a very marked progress, but it must be admitted that for the last four years there has been very little advance in quality; in fact, there rather seems to have been a retrograde movement. Of course the war has been to blame for this. The paper base has not been up to the old standard, the chemicals have been mostly substitutes, and as such have required much time in experimenting as to their capabilities in place of those formerly in use, and experienced emulsion makers, coaters, etc., have in some cases been called to the colours, so that the wonder is that we have been able to obtain so good an article as we have, even at the terrifically advanced price we have had to pay. However, we may hope that the war is over and that we may look forward to receive better materials and so be able to turn out better work all round. Not only the manufacturers of paper and chemicals have suffered in this manner, through the war, but photographers themselves have lost their best workmen, and have had to rely to a great extent upon unskilled help. No wonder, then, that progress has been slow.

The production of a good bromide print requires, firstly, a good bromide paper, secondly a good printer, thirdly a good developer who can tell a really good result from one that is merely mediocre, and can at once not only diagnose the cause of that mediocrity but can tell how to remedy it. The old tale of the artist and his pupil applies, "What do you mix your colours with?" "Brains, sir, brains." And it is brains that the bromide worker must use in every part of the process. There is also a little something, somewhat akin to brains, and which is known as "Nous"; this is not French for "we," but pronounced "nowse." The first point is to select a suitable paper or card for the negative to be printed. Thus if the negative is exceptionally bright and you have no paper in stock except "vigorous," put that negative on one side until you can obtain some of a softer grade. Should your negative, on the other hand, be soft or lacking in contrast, then the vigorous grade comes to the front; and if not sufficiently bright, there are such things as "gaslight" papers. No photographer should allow himself to be limited to any one grade of paper, for no matter how skilled a man the studio operator may be, the weather often beats him, and he cannot always produce negatives that are all of the same grade any more than he can produce them so that they all require the same exposure. In many instances a negative might produce a better result on matt paper than on glossy, or vice versa, but here the photographer is somewhat handicapped, for the choice so far is mostly made by the sitter, and the only chance is to show a proof on each. A very bad negative is often found to yield a better result on cream paper than on white.

When printing from a very thin negative in a machine, it will be found much better to reduce the strength of the light instead of endeavouring to give a very rapid exposure, as the absolute speed in a case of this kind cannot be accurately gauged, and consequently will vary considerably when a number of prints are required, whereas by a simple manipulation of the gas-tap the time of exposure can be brought within a workable limit. If a large number of prints are required from a negative, the usual test of exposure—viz., the first print—is hardly sufficient to ensure uniformity. A test should be made after at least every twenty pulls, and certainly with every fresh packet of paper or cards opened; the packets may not be of the same batch of emulsion, and it must also be borne in mind that be the illuminant either gas or electricity, neither are unchangeable. An extra light or two put on in the house, or, in the case of gas, a cooking stove or ring being put on makes a great difference, and even the lighting up in other houses or factories in the vicinity reduces the strength of your printing light. I know of two cases in point. In the one a munition works is close at hand, and directly they light up, the gas at the photographer's diminishes in power 25 to 30 per cent. In the other case, where electricity is the medium, a music hall is in close proximity, and the result of their lighting up is still more marked. It should always be borne in mind that the first aim of a printer is to secure an *exact* exposure and to maintain the exactitude throughout the run; it is not of any use to give a little less or a little more, thinking, or, rather, hoping, that it will all come right in the developer. Such an idea is quite erroneous: the developer may, to a certain extent, force up a slightly under-exposed print, but at the sacrifice of the whites, and an over-exposed one may be stopped when full detail is developed, but at the sacrifice of all pretence of brilliance; to develop such a print farther produces a worse result. There are some who, in the case of over-exposure, attempt to remedy matters by the use of a highly diluted developer with the addition of bromide; the only result is a print without blacks: what should be black is only of a greenish brown. A true brown can be obtained by abnormal over-exposure and very much weakened developer, *plus* a much larger quantum of bromide, the process of development in such a case requiring anything from 15 to 30 minutes, according to the brand of paper in use. Perhaps the most generally used developer is M.Q., and even with that there are numerous formulæ. If in doubt which to use, it is perhaps the best policy to take that which is given by the makers of the special brand of paper in use, and if it does not quite come up to expectations, a slight modification may be tried, bearing in mind that excess of hydroquinone tends towards a bluer image, that less hydroquinone and more metol tends to better blacks, while an increase in the carbonate speeds up the action, but has a tendency to induce flatness. On the whole, the M.Q. developer is an easy one to use, keeps for days, and retains its developing power to the last drop; the resultant print is of a pleasing tone of blue black. For the worker who prefers a truer black, amidol is certainly an improvement, but many persons are unable to use this if their skin is tender, or if they have any cuts or scratches on their hands; and as one who has suffered I can assure the reader that amidol poisoning is no joke. Rubber gloves or finger-stalls are a protection, but if much work is to be got through they render the handling of the paper with any speed somewhat difficult. To my mind there is no result that can equal that obtained with the iron developer, but here again there is the drawback that it stains the fingers far worse than either M.Q. or amidol, and stains them black.

While on the subject of developers and developing, I would specially advise the use of a *deep* dish and plenty of developer therein; a very great proportion of the "spoils" are caused by either too shallow a developing dish or too sparse a quantity of developer, either of which is instrumental in producing air bubbles and otherwise affects the even and clean result which should be produced. Too many prints should not be in the solution at once. Many think that the more prints they can cram in the quicker they will get through a given quantity of work, but actual experience has taught me that with, say, twelve prints in the bath at the time it takes no longer to develop, say, 500 than it would do with thirty in the bath at one time, and evenness of development is assured. When turning the prints over, the surface of each one should be carefully examined, and if any trace of a bubble is evident it should be wiped off with the ball of the thumb, and it will be found that if the exposure has been correct the part where the bubble has been will develop up to the same colour as its immediate surrounding; if the print has been over-exposed, well, it would have been a failure in any case. When strengthening the developer in the dish, it should always be done between two batches, never while any prints are immersed, as such a procedure always induces to staining and unevenness; in fact, it is almost impossible to prevent it.

As to rinsing between development and fixation opinions are varied. If the print is transferred direct from the developer to

the hypo-fixing bath, the process of development is at once stopped and the print seems brighter, but necessarily a certain amount of developer is carried with each print into the hypo, which becomes more rapidly deteriorated, and so requires more frequent renewal. On the other hand, if the prints are transferred from the developer into a bath of plain water, that in turn becomes a weak developer, and the developing process is carried on, slowly it is true, but none the less effectively. This may be remedied by making the water slightly acid, but even then too many prints must not be allowed to accumulate in it before transferred to the fixing. As to the fixing-bath itself, I strongly advocate plain hypo, especially where the preparatory wash has been in acidified water, and, with the paper we obtain nowadays, at least twenty minutes' fixing should be given, otherwise brown patches—the result of imperfect fixation—are sure to appear sooner or later, and, unfortunately, mostly later. I say unfortunately because the appearance of these patches will usually occur within a week or two after the prints have been issued to the customer, and so cause trouble and a lot of explanation as to "war conditions," etc., etc. For black and white prints a prolonged washing is not at all a necessity—in fact, it is rather the reverse where the prints are glossy and have to be enamelled, although for toning by the bleaching process it is absolutely essential that no trace of hypo should be left in the prints.

The various toning processes and hints thereon would take up too much space for the present article, but perhaps a few remarks on the subject of enamelling may not be out of place. For amateurs or small studio businesses the use of powdered talc (or French chalk) for preparing the base is probably conducive to the best results; in larger business, such as local view or trade work, oxgall is certainly preferable from its absolute security against sticking and the speed of the manipulation. The "base" should always be glass, where possible plate, or, failing that, 21 ozs. sheet; both sides may be used, which is, of course, not possible with either ferrotype plates or asphalt-coated blocks, which, while not subject to the danger of breakage appertaining to glass, are far more quickly worn out and done with, so that it will be found, with all the risk of breakage, the glass is still the cheapest in the end, as well as giving the best and brightest glaze.

C. Brangwin Barnes.

THE FIXING AND WASHING OF PRINTS.

[We find space for the following contribution to the "Photo Era" because it contains data which are very often asked of us by querists, viz., the numbers of prints which can be fixed with a given weight of hypo or, to put it the other way about, the quantity of a hypo solution of a given strength required for the fixation of a certain area of paper. Nevertheless, we are not of the opinion that this is the most advisable direction in which to seek to economise hypo. There are other and more important factors, *e.g.*, temperature and handling, which may easily falsify a rule based on so much hypo for so much paper. On this and other matters referred to in Mr. Stine's paper we have something to say on another page.—Eds. "B.J."]

The fixing and washing of prints is a subject of much importance. The fixing should receive just as much attention as the washing. Although it appears beyond a doubt that more prints are caused to discolour and fade by improper washing than by improper fixing, there are many that are discoloured by improper fixing.

Many times the print shows both faults—that is, improper fixing and improper washing. Improper washing, in most cases, is due simply to carelessness on the part of the worker. However, improper fixing, although it may be caused by carelessness, sometimes occurs with the most careful worker. In the latter case it is due usually to the worker not being thoroughly acquainted with the various chemicals used in the fixing-bath, to the lack of knowledge as to the life of the bath, or to the method of handling the prints while in the bath. It ought to be remembered that prints should be immersed quickly and evenly in the fixing solution, whether or not the short-stop bath is used. The fixing process is very important with regard to the permanency of the prints; therefore it is advisable, for the first few minutes, to keep the prints moving in the bath so as to ensure even fixation.

The prints should be separated occasionally during fixing and allowed to remain in the bath at least fifteen minutes. However, ten minutes in a freshly-made bath will be sufficient if one is attentive to this part of the work and separates the prints at intervals of one minute. It is possible to fix prints in a shorter time than that stated above, but one should not practise this rapid fixing, or sooner or later there will be trouble. A print that is fixed improperly will show this defect usually before reaching the hands of the customer. When sensitive silver-salts are exposed to actinic light, those parts of the print that contain such salts will usually turn pink during the washing of the prints if this work is done in daylight; if not, then the defect will be discovered later during the course of finishing.

One should never use an exhausted bath, as the results obtained will not be permanent. Therefore, if it becomes frothy or suds remain on the surface when the solution is agitated violently, one should discard it and make up a fresh bath. However, a better method to ascertain when the bath has become exhausted is to keep an account of the number of prints that have been fixed in a certain quantity of solution. Then, when the number has been reached that the particular amount of solution has been tested for, one should discard the fixing-bath. This method also tells one that there has been no waste, and this is an important factor in all lines of business.

As stated before, a print that is fixed improperly contains sensitive silver-salts which, upon exposure to actinic light, will cause these salts to change to a pinkish tint, the action being slow or rapid according to the amount of sensitive silver contained in the emulsion. It matters not how long or how thoroughly a print may be washed; if there is any sensitive silver contained in the emulsion, those salts will slowly or rapidly change to a pinkish tint. If the print has been washed improperly, one will discover, in the course of time, the appearance of a yellow stain, which gradually causes the image to fade, the action being slow or rapid according to the amount of hypo contained in the print. Therefore, it becomes evident that to make a print as permanent as the paper-stock upon which the image is supported thorough washing is necessary. All the sensitive silver-salts must be eliminated from the print that have not been reduced to a metallic form by the action of the developer. After this has been done it becomes necessary to eliminate thoroughly all the hypo contained in the print so as to ensure its permanency.

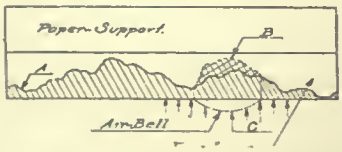
A properly compounded fixing-bath will answer its purpose for all kinds of developing-out papers. It should contain what is known as a hardener. The hardener is not absolutely necessary for the permanency of the prints, as one can use a plain hypo-bath and obtain prints that are just as permanent as those fixed in a bath to which hardener has been added. The acid hypo-bath is the practical one to use, for the reason that it can be used over and over again until it is exhausted, whereas the plain bath—that is, plain hypo and water—must be made fresh every day; in fact, a new bath must be made up just as soon as it becomes slightly discoloured. If one should ignore the above instructions, the resulting prints will be found to have a yellow stain, either generally or locally.

The plain hypo-bath can be used successfully during the winter months, as all the solutions can be kept at a normal temperature; but during the summer months it is not practicable, for the reason that in warm weather the prints have a tendency to blister and frill. Since there are no chemicals in the plain hypo-bath to overcome this tendency, the bath becomes impracticable—in fact, one should use a plain hypo-bath only when it is absolutely impossible to obtain an acid hypo-bath. This bath is undoubtedly the safest and best to use, for the very simple reason that the various chemicals contained therein preserve the bath until it has been completely exhausted—thereby preserving the colour of the print—and it checks development immediately by placing the print in an acid state. Moreover, it hardens the emulsion so as to eliminate frilling and blistering.

If the prints have been placed into the fixing solution unevenly there is a possibility of air-bells forming on the face of the print, in which case, if they remain during the fixing period, one will find spots or possibly pinkish spots appearing on the face of the print. This is due to the sensitive silver-salts contained in the parts covered by the air-bells not receiving the action of the hypo. Therefore, the best remedy for this trouble is to separate the prints occasionally in the bath so as to eliminate this fault and to allow even fixation. Again, if one fails to separate the prints properly while they are fixing—even though there are no air-bells—it will be found that the parts where the prints are sticking together do not allow the bath to eliminate the free silver, and again one finds the same result—that pinkish stain. If one should fail to separate the prints properly while they are washing, one will find that in time those parts of the prints will begin to fade away just the same as prints that have been given but a few rinses of water to eliminate all the hypo. Water cannot eliminate hypo from those parts when the prints are adhering tightly together; therefore, be sure to separate all the prints in the fixing-bath and wash waters frequently and very thoroughly.

After the prints have been fixed properly, they should be washed thoroughly so as to eliminate all hypo. This should be accomplished either by the aid of running water for one hour or by twelve changes, allowing the prints to remain in each change for five minutes. It matters not which method of washing is used with regard to the permanency of the prints, provided one turns each print over in the wash-water at least every five minutes during the washing period, and a complete change of water at least every five minutes is made.

Occasionally one will notice dark circular spots on prints while in the sepia bath. These are impossible to remove successfully unless they are exceptionally small. There are many reasons for these marks; but the most common cause is scamping the handling of the prints either in the acid short-stop or fixing-bath. When prints are placed in the bath they must be immersed quickly and evenly so as to obtain even fixing; but if one scamps his work and places the prints carelessly in the solution, face down, there is a possibility of air-bells forming on the surface of the prints and development continuing, thereby causing those parts to be darker in tone, although usually unnoticeable in the black-and-white print. If the air-bell remained during the entire period of fixing, the spot or spots would turn pink upon exposure to actinic light; but in most cases these air-bells are destroyed—in time to fix these parts properly—by the prints being separated occasionally in the bath. As stated above, these spots are not noticeable in the black-and-white print, due to the tone; but are very noticeable after sepia toning, for the reason that sepia tone is lighter and more transparent than the olive black, and those parts under the air-bells are of a deeper sepia tone than the surrounding parts, due to prolonged development. It should be understood clearly that, to avoid this trouble, one should be very careful to keep the prints in constant motion during the first few seconds when prints are placed in the fixing-bath or acid short-stop, so as to eliminate all troublesome air-bells. The diagram illustrates this point.



A = Line of correct development. B = Line of forced development. C = Action of fixing-bath.

The table giving the number of prints that can be fixed thoroughly in sixty-four ounces of bath is based upon the following excellent formula :—

A. Hypo	.....	16 ounces
Water	.....	64 ounces

Dissolve and then add solution B.

B. Water	.....	5 ounces
Sodium sulphite (dried powdered)	.....	½ ounce
Acetic acid No. 8	.....	3 ounces
Alum (powdered)	.....	½ ounce

One should be very sure to dissolve each chemical in the order given so as to obtain an accurate bath. The fixing bath, as stated before, should be used at a temperature of 65 degrees for summer and winter, although a little variation up or down is permissible.

NUMBER OF PRINTS THAT CAN BE FIXED IN SIXTY-FOUR OUNCES OF HYPO FIXING BATH.

Size of Print.			Number of Sq. Inches.	Number of Prints.
3⅞	x	5½	21·31	250
4	x	5	20	266
4	x	6	24	222
4¼	x	6½	27·6	193
4¾	x	6½	30·9	172
5	x	7	35	152
5	x	8	40	133
6	x	8	48	111
6½	x	8½	55·3	96
7	x	9	63	84
8	x	10	80	66
10	x	12	120	44
11	x	14	154	34
12	x	16	192	27
14	x	17	238	22
16	x	20	320	17
18	x	22	396	13
20	x	24	480	11

It has been found that 64 ounces of hypo and fixing bath will thoroughly fix 250 (3⅞ by 5½) cabinet prints; therefore, 3⅞ by 5½ by 250 is 5,328 square inches of area that will be thoroughly fixed by such a bath.

Problem.—Find the number of 8 by 10 prints that this bath will fix thoroughly.

Solution.—8 by 10 equals 80 square inches in one 8 by 10 print. Bath will fix 5,328 square inches, therefore 5,328 divided by 80 equals 66 prints.

In bringing this article to a close, I should like to impress upon the mind the fact that the thorough fixing and washing of prints is of vital importance to one's photographic business.

GEORGE F. STINE.

Assistants' Notes.

Notes by assistants suitable for this column will be considered and paid for on the first of the month following publication.

Women and Photography.

WOMEN are displacing men as photographic workers. Are they more competent, more suitable, or only cheaper? It is a matter well worth the attention of every photographer, employer or employed.

There was a time when managing, operating, and printing were male prerogatives. While manageresses were few and far between, lady operators and printers simply did not exist. Necessities of war changed all that, and peace finds us with more women than men in responsible positions. This was, of course, expected, but it seems that the ladies are staying, and signs are not wanting that as time goes on their numerical superiority will increase until the day arrives when the male photographer will have become a thing of the past.

War no longer deprives the labour market of men. The R.A.F. alone could supply thousands of skilled photographers were they wanted. The ladies are firmly established. Why?

Let us consider the claims of superiority made for them by many employers. An accomplished photographer is versed in art, chemistry, and mathematics to some extent at least. Besides this, the successful exponent is generally something of a plumber, electrician, and carpenter. Now, although ladies have done well in the various branches of science and art, we have yet to learn that mere man has been equalled or left behind. A perusal of inventors' names will show that. When it comes to the odd jobs so necessary at times on photographic premises—the hurried repair of a machine,

or electric wire, for example—how many competent women workers are there who can still hold their own?

I will be told that odd jobs are not photography. They always were with the male assistant.

Practical efficiency is not everything, however. I have worked with male and female staffs, and must admit that the latter are—*or were*—the more tractable and long-suffering. I say *were*; let us look around. Women everywhere are coming into prominence and asserting themselves. The old docility is fast vanishing. Many girls prefer to be out of work rather than take up jobs that once they begged for. Why? Well, to put it brutally, they've "had some," and their future attitude to every job is likely to be the same if conditions and pay are not very good.

The Marchioness of Derry, a keen exponent of the rights of women workers, maintains that men and women should have the same pay for the same output. On the face of it, this is bare justice. If we go to buy a loaf or a grand piano, we don't expect the bill to be less if presented by a woman. Why, then, should we expect to buy *work* cheaper off a woman? Do lady operators and printers receive men's pay? If so, the argument of superiority is clinched in their favour. If not, they must be poorer workers, or else they are underpaid—in other words, they keep ex-service men out of work by partly giving their own work away.

But perhaps the feminine temperament is more suited to photographic work. With regard to the most important branch—management—it is simply a matter of opinion about which volumes might be said and written without any good being done. As for operating, the ideal temperament is not essentially masculine or feminine. Some studios, bosses, and sitters, might prefer a man, others a lady. There is no visible reason why either need be inferior to the other in studio work.

There can be no question, however, of woman's unsuitability for work in the average dark room. A naval acquaintance of mine who was once a bromide printer describes a submarine as a blanketty convalescent home in comparison to the dark-room. I understand there is a girl at present in his old job. Granted that Phyllis or Marie may keep a room cleaner than Tommy or Jack did, it still cannot be denied that woman's constitution is not suited to working in any but the most up-to-date and sanitary dark-rooms, and these are not over plentiful.

There is another kind of suitability for work, dependent on the individual's initiative and thinking capacity, which is often overlooked. A single illustration will explain.

Two rival commercial houses employed men for the "pivotal" and important jobs—supervision, negative making, and enlarging—and girls for mechanical or routine work—"straight" printing, developing by time, etc. Left with one man, one firm refused all-important work over and above what he could do. Placed similarly, the other house filled the soldiers' old jobs with girls. At first the latter method seemed to triumph, but the final result is in favour of the other house, which with men back at work has taken up its old reputation and some of their rivals' business as well.

The cause of this was not want of technical efficiency on the girls' part; it was rather due to the male faculty for diagnosing the *customers'* ideas, which faculty explains the prevalence of men behind lingerie counters, and accounts for hotel diners preferring waiters, who study the *diner*, to waitresses, who are content to study their technical duties only.

There is a general supposition that female labour is cheaper than male, and if being cheaper means costing less in coin of the realm, there is plenty of evidence in support. But to be cheaper requires more than this. The girl who does a week's work equal in quantity and quality to that of a good man, and does it for the same sum that a Ford parking-ease breaker gets per day, is undoubtedly cheap, but this sort of thing won't last. As I have already pointed out, women are waking up; women's unions are appearing in various trades, and female workers are promising to become more independent and arbitrary than males.

When this can be said of photographic employees, perhaps the mere man will come into the field again, but it's quite on the cards that, by then, he will have been squeezed out of the profession—or the country—for good.

THERMIT.

Exhibitions.

CARBON AND OZOBROME PRINTS.

An interesting demonstration of the qualities of carbon and Ozobrome printing is now offered in the exhibition of photographs by these processes which is being held at the Camera Club, 17, John Street, Adelphi, London, W.C. The prints are provided by the Autotype Company, which now, so we gather from a circular, is the manufacturer and purveyor of materials for the Ozobrome process. A very great range of photographic effects shows the corresponding capacity of the carbon process to render in the fullest way the quality in negatives of most diverse subjects. Coming away from the rooms of the Camera Club, one mentally contrasts the beautifully romantic effects in a low key, such as many of those of Mr. Alex. Keighley, or to select an equally fine example, the "Stygian Shore" (No. 22) of Mr. Sümmons—as we say, one contrasts these prints with the high-key studies of translucent ice which are shown by the Australasian Antarctic expedition. Nothing, perhaps, could better exhibit the versatility of the carbon process, not only its capacity for tone rendering, but equally its choice of colour appropriate to the subject. The exhibition contains some striking portraiture by Craig Annan, Malcolm Abuthnot, and the Earl of Carparvon. The Ozobrome process is represented by only a few examples, but these show very charming landscape work by its inventor, Mr. Thomas Manly. The exhibition remains open from 11 a.m. to 5 p.m. until April 30, and on April 24 a demonstration of carbon printing will be given at 8 p.m. by Mr. A. C. Braham. Tickets of admission to this fixture may be obtained on application to the Secretary of the club, or to the Autotype Company, 74, New Oxford Street, London, W.C.1.

PHOTOGRAPHS BY THE ROYAL AIR FORCE.

An exhibition of photographs, presented under the title "War in the Air," by the Royal Air Force is now being held at the Grafton Galleries, New Bond Street, London, W. In interest and in the photographic quality of the coloured enlargements it is certainly the finest of the war photographs exhibitions which have been held. Whoever is responsible for "putting on" the exhibition it is evidently someone with a keen sense of the kind of subject which will interest the public. There must have been an immense amount of spade work done in making the selection from the enormous mass of photography accumulated by the R.A.F. Here, however, we see for the first time some of the achievements which have brought about Great Britain's superiority in the air. Perhaps the chief of these, of which a number of photographs are to be found in different parts of the exhibition, is the now famous "hush" ship, the "Furious," with its immense upper deck of size to receive a squadron of aeroplanes and still find room for an airship or so. One of the photographs shows the operation of the tackle employed in raising a machine from its under-deck hangar. There are some striking pictures of the operations of the R.A.F. in Palestine in the shape of prints showing Turkish troops scattering in the hopeless attempt to escape the British airmen's bombs. Some photographs taken obliquely from the air of such well-known places as Edinburgh and Trafalgar Square show the great usefulness of such photography for topographical purposes. A note in the catalogue mentions that the enlargements and their colouring again owe their quality to Messrs. Raines and Co., of Ealing. The exhibition remains open until the end of May, from 10 a.m. to 6 p.m. on week-days and 2.30 to 5.30 on Sundays. The charge for admission is one shilling, the proceeds going to various charities connected with the R.A.F.

FORTHCOMING EXHIBITIONS.

April 17 to May 22.—Hammersmith Hampshire House Photographic Society Annual Exhibition. Two open classes. Joint secretaries, J. G. Abrahams, 41, Hamilton Terrace, London, N.W.8; A. H. Page, 12, Lime Grove, London, W.12.

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Applications, March 24 to April 5.

MOUNTING.—No. 7694. Device for fixing cards, photographs, etc., in albums. P. B. Pattisson.

CINEMATOGRAPHY.—No. 7683. Cinematograph spool. W. J. Arnold.

CINEMATOGRAPHY.—No. 7445. Producing moving picture effects for advertising. H. C. Burbridge.

CINEMATOGRAPHY.—No. 7942. Shutter for cinematograph film projectors. S. W. Bentley.

CINEMATOGRAPHY.—No. 7857. Motion picture machines. M. B. Burgess.

CINEMATOGRAPHY.—No. 7515. Cinematograph projectors. J. A. Eversden.

CINEMATOGRAPHY.—No. 7728. Cinematograph, etc., machines. M. Gordon.

CINEMATOGRAPHY.—No. 7375. Cinematograph apparatus. H. J. Hinks.

PRINTING.—No. 8,373. Photographic printing. F. W. Donisthorpe.

CINEMATOGRAPHY.—No. 8,174. Cinematograph projectors. W. Engelke and H. H. Wrench.

DARK-ROOM LAMPS.—No. 8,039. Photographic dark-room lamps. J. Hazel.

CINEMATOGRAPHY.—No. 8,545 Film-moving mechanism of picture machines. W. E. Minue.

DEVELOPING TANKS.—No. 8,600. Developing tanks for photographic films. C. N. L. Pilditch.

CINEMATOGRAPHY.—No. 8,595. Carriers for transport of cinematograph films. A. E. Rees.

CINEMATOGRAPHY.—Nos. 8,046 to 8,048. Cinematograph cameras. W. C. Vinten.

COMPLETE SPECIFICATIONS ACCEPTED,

These specifications are obtainable, price 6d. each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

LANTERN-SLIDES.—No. 123,892 (May 6, 1918). The invention consists in a lantern-slide, used for announcements, mounted so that it can be raised or lowered vertically in the cinematograph lantern stage. It is raised by a spring drum and lowered by pulling it down by hand. Robert George Elder, of 16, Warton Terrace, Heaton, Newcastle-on-Tyne.

CINEMA-FILMS.—No. 123,842 (March 12, 1918). The invention consists in a film having words, or the letters thereof, progressively impressed near to the mouths of figures as a means of indicating a supposed dialogue. The words may be impressed photographically or from metal type. Samuel Albert Flower, 17, Newnham Road, Wood Green, London, N.

LANTERN SLIDES.—No. 113,156 (February 20, 1917). Two rectangular pieces of glass are selected of exactly the same size. On to one of the pieces of glass are placed three or more single pictures cut from waste cinematograph film. The film pictures, which are placed longitudinally on the glass and a little distance apart, are secured to the glass by narrow strips of black adhesive paper passed across their ends. The second piece of glass is then placed on the top of the pictures and the frame is bound securely together by strips of black gummed paper or tape, or other adhesive material, placed round the four edges.

The advantage claimed for the invention is that the slide thus formed is greatly superior to the present one, as the pictures used will be cuttings from the best quality films, showing excellent photography.—Frederick Winton Perkins, 12, Norton Road, Letchworth, Herts.

FILM SPOOLS.—No. 113,919 (September 19, 1917). The invention has for its object certain improvements in roll films whereby films of one size may be employed in different-sized cameras. In roll-film cameras it is usual to provide markings upon the backing paper for the film, such markings being spaced apart a distance equal to the length of film necessary for each exposure in a camera of a particular size, and showing the number of exposures that have been made. As distinguished from the foregoing, in accordance with the invention the backing for the film is marked in such a manner that a single spool of film of any particular width can be used in any camera made to take films of that width. The divisions on the backing paper are units and sub-divisions of units of length, and enable the user to ascertain the actual length of film used instead of the number of exposures of a predetermined size. The divisions are consecutively numbered and are of known dimensions, 1 centimetre for example. The half centimetre, quarter centimetre, or even smaller dimensions may also be indicated, but not necessarily identified.

The user of such a roll of film would be provided with a table giving names of various cameras in which the spool could be used, and giving against each camera the numbers which should appear at the usual opening or window in the back of the camera, as the successive exposures are made, allowance being made so that there is a division between the exposed portions, and overlapping of the photographs is avoided.—Herbert Nimmo, 44, Kirby Street, Hatton Garden, London, E.C.1.

X-RAY PAPER.—No. 114,933 (June 4, 1917). A sheet of paper or like flexible material previously sensitised in any known manner is coated with a paint or wash of venetian red, chrome yellow, or other suitable preparation which is impervious to light and is easily removable by washing or other similar process. The opaque coating forms protection to the sensitised surface and admits of the paper being handled openly, dispensing with the use of light-tight envelopes and the like, the treated paper being made up in single sheets or in books, packets or blocks containing the desired number of sheets.

For producing a print the prepared sheet or two or more superimposed sheets is supported behind the object to be radiographed, the print being thus taken directly on the paper or a like print on each of the superimposed papers or sheets, which is subsequently washed to remove the opaque coating and develop the print or prints.

By means of the invention, X-ray photographs can be produced with the utmost rapidity, whereby immediate inspection of the finished print is obtainable, this in many cases being of considerable value.—George William Kilner Crosland, New North Road, Huddersfield, and Thomas Pearson Kilner Crosland, Fitzwilliam Street, Huddersfield.

MARKS PLACED ON THE REGISTER.

The following marks have been placed on the register:—

W. B. DESIGN.—No. 385,673. Photographic chemicals. White Band Manufacturing Co., Limited, 121, Selsdon Road, South Croydon, Surrey; manufacturing chemists.

Analecta.

Extracts from our weekly and monthly contemporaries

Development in the Tropics.

AMIDOL (writes F. Weston in "The Amateur Photographer and Photography" for April 16), owing to the fact that it can be used without an alkali, is specially suitable for developing plates in high temperatures. Any of the standard formulæ may be used. Above 80 deg. Fahr. one may get a little fog, but the following developer can, it is said, be used up to 104 deg. Fahr. with good results, both as regards fog and prevention of the melting of the film.

Water	35 ozs.
Amidol or diamidophenol	75 grs.
Sodium sulphite (anhydrous)	7½ drms.
Ammonium sulphate crystals	8 ozs.
Potassium bromide	45 grs.

The mixed developer will not keep for more than a few days. The

ammonium sulphate can be replaced by 4½ozs. of anhydrous sodium sulphate. For tank use, it would be necessary to ascertain by actual experiment the times for development at different temperatures.

The plates should go direct from the developer into a hardening-fixing bath. The following is a good one:—

Potassium metabisulphite	150 grs.
Hypo	4 ozs.
Water	20 ozs.
Chrome alum	150 grs.

Dissolve in the order in which they are named.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

MONDAY, APRIL 21.

Croydon Camera Club.—Easter Monday Outing.

WEDNESDAY, APRIL 23.

Croydon Camera Club.—"Discrimination." Cavendish Morton.
Ilford Photographic Society.—Annual General Meeting.
Dennis an Amateur Photographic Association.—Whist Drive.
Photomicrographic Society.—"Some Photographic Difficulties in Photomicrography." G. Ardaseer.
South London Photographic Society.—Kerotype Demonstration. Messrs. Kerotype, Ltd.

THURSDAY, APRIL 24.

Huddersfield Naturalist and Photographic Society.—Practical Demonstration. "The Wet Collodion Process." J. C. North.
Hammersmith (Hampshire House) Photographic Society.—National War Pictures.
Richmond Camera Club. Photographic Difficulties in Photomicrography. G. Ardaseer.

CROYDON CAMERA CLUB.

NOVELTIES and home-made apparatus were to the fore last week, and despite a gloomy forecast by the secretary, the evening proved a complete success. The most welcome novelty, possibly indirectly due to the splendid action of the Liverpool dockers, consisted of the contents of a bottle labelled "whisky," which, divided amongst thirty to forty members, was sufficient to alleviate the feeling of resentment born of recent privations.

Mr. F. Ackroyd showed a bunsen burner converted into a gas fire lighter. This is connected to the gas supply with a length of the familiar flexible metallic tubing with rubber connectors. Rubber gradually perishes on exposure to light and air, and if the connectors are covered with adhesive black compounded tape (as used for insulating electrical joins) their life will be greatly prolonged. The same idea had occurred to other members, and they congratulated Mr. Ackroyd on his cleverness. Mr. Harpur pointed out that this flexible tubing frequently leaks, which can be prevented by winding round the tape throughout its length without any material loss in flexibility. "Hunt's tape" was alluded to as being excellent. Mr. Ackroyd next showed a beer-warmer, which he said served the purpose of making tea in office hours. This was believed, as he is the antithesis of the beer-warmer type. He remarked that the utensil had a large hole in the bottom, yet had never leaked. Several references being made to "George Washington," he explained that as the hole in the metal gradually formed it filled up with a calcareous deposit. He then passed round the beer-warmer, and those who handled it noticed with considerable dissatisfaction a loose carbonaceous deposit on its outer wall. At this point Dr. Knott, mistaking the office boy for a towel, a disturbance arose.

The Rev. Le Warne was the next star turn, and it can be said with confidence if he is as successful in converting erring humanity to better things as he is in converting apparatus to weird uses he must be a sky-pilot of pristine quality. A handy retouching desk was shown, improvised out of a studio dark-slide, and, like an ex-sinner, capable of backsliding at short notice. The President, Mr. J. Keane, then demonstrated the "Flying Corps" developing tank, a well-designed and solidly constructed apparatus. It permits of the insertion of a thermometer into the developer without admission of light, a really valuable feature. Dr. F. Knott produced several unbreakable glass measures, which were severely tested by members and came through unscathed. Being composed of glass under tension, when they do go only fine dust remains. To those whose habits engender a feeling of uncertainty regarding the position and number of external objects, they should powerfully appeal.

Mr. V. Jobling showed a home-made camera "with all projections flush with the front," a feature believed to be unique; also a folding walking-stick tripod. This and the camera illustrated skill in design and craftsmanship of the highest order. The shutter had its release placed in front, and therefore was actuated by pressure towards the body, an ideal way for minimising any tendency to shake at the moment of exposure. Many others materially contributed to the interest of the evening.

EDINBURGH SOCIETY OF PROFESSIONAL PHOTOGRAPHERS.

THE seventh meeting of the session took place on Monday, April 7, Mr. Young in the chair. A letter was read from Mr. Massie, hon. secretary of the Edinburgh Photographic Society, intimating that the proposal to invite the 1920 Scottish Salon to Edinburgh had been discarded owing to the unsettled conditions. He thanked the society for the interest which the members had taken in the matter.

Mr. Young then read a letter from Mr. Sutherland, secretary of the Edinburgh College of Art, intimating that the society's request for the formation of a retouching class had now been granted, on condition that Mr. Young should undertake the tuition personally. This Mr. Young intimated his willingness to do. The class would start in the autumn, and would be held twice weekly, from seven to nine in the evening. Mr. Campbell Harper expressed the society's indebtedness to the president for the manner in which he had pulled this matter through.

Mr. Young then brought up the question of the apprentice. He said that it was now time for the society to formulate a scheme of some definite nature. Letter after letter was being published in the "British Journal" on this question, and, in fact, since he had mentioned the theme in his October address, hardly a week had passed without some contribution of this nature. The P.P.A. merely groped around the subject. The first thing which the photographer could do for his assistant, Mr. Young continued, was to see that he received a proper training, and the beginning of that was an apprenticeship. We lived in different times, and the old conditions no longer held good; and we must have some definite scheme of modified apprenticeship. In two years' time, he pointed out, every assistant under eighteen years of age would be compelled to attend classes during business hours, and the newly-arranged retouching class would then become a day class. He added that he would be glad to hear the views of the members on the subject, and suggested that a committee be appointed to formulate a scheme.

Mr. Johnston pointed out that the public opinion of photography as a profession was anything but a high one, and hence the difficulty of obtaining boys suitable for apprentices. Mr. Young thought that classes of various kinds would greatly help to alter this situation. Mr. Rushbrook felt that this was a matter for all the photographers in Britain. It was pointed out, however, that the onus of making a start would devolve on some small body, and, a lead once given, the idea would spread. The great difficulty which all photographers experienced in giving an apprentice a good knowledge of all the branches was discussed, and it was hoped that by the growth in the number of technical classes the master photographer would be relieved of much personal tuition. A committee, consisting of Messrs. Rushbrook, Campbell Harper, and Johnston, was then appointed to consider the whole question and to make a report.

Mr. Johnston then made his report on behalf of the Exhibition Committee. He gave facts and figures regarding the New Gallery, Shandwick Place. Three weeks would be necessary for the exhibition, one for the purposes of hanging, and the other two for the exhibition. The probable cost for this, including advertising, would be about £60. It was felt that it would be more dignified if the exhibition were not a competitive one, but a competitive class for assistants might be arranged. Mr. Young said that he was anxious to see this exhibition representative of all classes of photography. It was decided to bring the matter up for further discussion.

A scheme of co-operative advertising was then placed before the members, and the details explained. Some nine firms have so far expressed their willingness to enter into this scheme, which promises to be of great benefit to the profession in Edinburgh.

South London Photographic Society.—At the annual general meeting on Monday, April 7, good progress was reported. The president, Mr. W. F. Slater, F.R.P.S., who has worked so hard for the benefit of the society for the past two years, is a well-known figure in photographic circles, and it is with some considerable regret that the rules of the society only permit his occupying that position for the above-mentioned period. As demonstrator and lecturer his services have been much appreciated, and the members present expressed their appreciation. The secretary reported a very successful year's working, with an increase of 33 per cent. in membership. The hon. treasurer reported that the year's working showed a profit, which is gratifying, as the year had been commenced with a balance-sheet showing a slight loss. The following officers were elected :—President, W. B. Ashmole; hon. secretary, Ernest W. Brooks; hon. treasurer, W. F. Slater, F.R.P.S., F.R.G.S.; hon. curator and librarian, L. J. Blake; hon. portfolio secretary, E. C. Perry; hon. excursion secretary, J. Pickwell; hon. lanternist, C. H. Manger; committee—Messrs. Gideon Clark, H. Creighton Beckett, E. R. Bull, C. H. Oakden, Horace Wright, H. Richards, W. H. Howard, W. McEwan, E. W. Taylor, W. E. White, Arnold J. Burt, and E. Gorfin. The new syllabus is now ready, new members are required, and professional workers are invited to join, as this society already includes a good few members of the trade. A copy of the Handbook will be sent free upon application to E. W. Brooks, 4, Ferndale Road, S.W.4. The next meeting at the Central Library is fixed for 7.30 p.m., Wednesday, April 23, when Messrs. Kerotype, Limited, are giving a demonstration of their Kerotype paper.

News and Notes.

Lancashire Society of Master Photographers.—In connection with the exhibition by members to be held at the Art Gallery, Blackpool, on May 27, 1919, the committee desire that specimens submitted should be sent unmounted and *not* framed. The response from members is very satisfactory, but there is ample room for several more photographs. Entries will be in time if received by the hon. secretary up to Monday, April 28.

Photo-micrographic Society.—The next ordinary meeting will be held on Wednesday, April 23, at 7 p.m., at King's College Bacteriological Laboratories, 62, Chandos Street, W.C., when F. Martin Duncan, F.R.M.S., F.R.P.S., will lecture on "The Preservation and Preparation of Microscopic Objects for Photomicrography." Visitors are invited and cards of invitation may be obtained on application to the Hon. Sec., J. G. Bradbury, 1, Hogarth Hill, Finchley Road, Hendon, N.W.4.

Photographic Flame Tests.—Describing the research now being undertaken by Professor H. B. Dixon in petrol substitutes, the "Times" mentions that an exceedingly interesting and ingenious device used by him is a camera of recording the "spread of the flame" in an explosion. It will take a hundred yards of film photograph a second, and as the film moves at right-angles to the motion of the flame and the lens reduces the image to one-twelfth of the original, it follows that the camera provides a means of analysing a flame travelling at velocities up to 3,000 yards a second. This is an apparatus which Professor Dixon had perfected before undertaking the present investigations.

Death of Madame Lallie Charles.—The death is announced of Madame Lallie Charles, for many years a well-known society photographer, having her studio and residence in the exclusive Mayfair thoroughfare of Curzon Street. There she conducted a business without any of the outdoor advertisement, in the shape of showcase or window, which even the photographers of Bond Street cannot bring themselves to forgo. Her customers were almost without exception women, and we believe her connection included not only a goodly proportion of London Society, but people of wealth and standing in South America. Some few years ago Madame Charles was the unsuccessful defendant in the lawsuit arising from the building of her Curzon Street studio, as the result of which, and also, so it is stated, of the war upon her business, she became financially embarrassed.

The Late Alfred S. Corey.—We are extremely sorry to have news from New York of the death of Mr. Alfred S. Corey, technical editor of the "Motion Picture News." Mr. Corey was an enthusiastic student of progress in the fields of optics, colour photography and colour cinematography, and during the last few years we have owed to him the opportunity of publishing descriptions of technical advances, particularly in colour cinematography, in the United States which had come under his personal notice. His interest in the technical side of optics and photography was shown by the very valuable résumés of the literature of these subjects which he offered to readers of his paper. It was technical information of a kind which, we may guess, found exceedingly few readers in the American cinematograph industry. Mr. Corey was a large buyer of books from England, and we are asked to remind any booksellers or publishers before whom this notice may come that his affairs are in the hands of Mr. Allison, of Allison and Haddaway, 235, Fifth Avenue, New York, who is taking steps to discharge any of his liabilities.

Correspondence.

**** Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

**** We do not undertake responsibility for the opinions expressed by our correspondents.*

THE SECRETARYSHIP OF THE PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

To the Editors.

Gentlemen,—Will you be good enough to afford the courtesy of publicity in your columns to advise readers who may be members of the Professional Photographers' Association that all communications should now be addressed to the undersigned, who has been appointed by the council honorary secretary for the ensuing twelve months? S. H. Fry.

5, Highbury Grove, London, N.5.

BRITISH AND GERMAN LENSES.

To the Editors.

Gentlemen,—Referring to the article entitled optical glass, the testimonial of a German photographer to the superiority of British lenses may be of interest. The man in question—one of the most competent professional photographers in the city of Buenos Aires, whom I met there six years ago—was using a Ross-Zeiss; and when I remarked on the fact he confessed that at first he had obtained a "Zeiss" direct from Jena, and, being dissatisfied, had obtained the English lens, which he found far superior. As the formulæ of both lenses were identical, the natural inference is that the British firm's system of manufacture—cementing, grinding, etc.—is the more perfect.—Yours faithfully,

Charles L. Lowther.

Lonsdale Studio, 194, South Lambeth Road, S.W.8.

A COMPLAINT OF ADVERTISERS.

To the Editors.

Gentlemen,—I wish to call your attention to the quite unnecessary delay by photographers in deciding whether goods advertised in the "B.J.," and at their request sent them on approval, are suitable or otherwise; also to the considerable delay (I am writing from my own experience) in releasing moneys deposited with "B. J." for such goods sent on approval, and which have not been approved and returned to owner. These are one or two instances :—

On March 6 ult. I sent £7 direct to a firm advertising in the "B. J." for certain photographic apparatus to be sent to me on approval, which duly arrived a day or two after. I returned the apparatus the same day as received by post, it not being what I was looking for. After writing several times, I eventually got back my £7, less cost of carriage, *on the 4th inst.* Accompanying the cheque was a letter: "Your further orders will be much esteemed, and receive our prompt attention."

On March 20 ult. your publisher acknowledged receipt of my deposit of £4 15s. for apparatus to be sent to me on approval from Cambridge, which reached me on the 28th ulto., and not being approved was returned by registered post the next day. It is now the

8th of April, and I am still waiting the return of my deposit, although I paid carriage both ways, and have written the owner three times asking for its release.

Ten days ago I sent a camera on approval by passenger train. On the 4th inst. I spent 1s. 6d. for a pre-paid wire to ascertain this photographer's decision!

Why cannot photographers "get a move on," sirs, and conduct this goods-on-appro. deposit system in a business-like manner, make prompt decisions, accept or return goods quickly, and release deposits quickly? Such delay is not fair to the man advertising the goods, as he may have other applications and other deposits waiting, and may probably lose a sale, entirely owing to these procrastinating ways of doing things.—Yours faithfully,

A Believer in Business Methods.

AERIAL PHOTOGRAPHY IN THE WAR.

To the Editors.

Gentlemen,—In your recent report on the discussion at the Royal Photographic Society on aerial photography, we observed that the name of Flight-Lieut. C. F. Lan-Davis was not mentioned, nor was that of his firm, J. H. Dallmeyer, Ltd., the speakers naturally confining themselves for the most part to reporting those contributions to the art which were within their personal knowledge. We trust you will allow us in the same spirit to put on record that we also had the privilege and fulfilled the duty of supplying many telephoto and other lenses for aerial photography, including our new large Adon and patent lenses, during the war.

We feel sure that Captain Hetherington, if referred to on the subject, would bear us out; and Major Charles W. Gamble, in an interesting lecture, mentioned that a Dallmeyer lens had worked very well in aerial photography, though it does not appear to have been specially prepared for the purpose. We are now enabled to publish an extract from a memorandum by the late C. F. Lan-Davis, F.R.P.S., written in the very early days of aerial photography at the Dardanelles towards the end of 1915, and we may mention that the dark room which he built on Imbros with materials obtained from the sources mentioned in the extract, and from wreckage of a British ship, was in its time among the most important of the extemporised military buildings on that island. The following is the extract from a memorandum of about October, 1915:—

"There were a few stores and tools available, and only by going round personally begging from the 'Ark Royal,' Egyptian Engineers, Maps Office, etc., was I able to get started. I finally succeeded in getting a darkroom built and equipping it. The best method of attachment of the camera to a machine presented difficulties, as the home idea had been to hold the camera in the hand. This was clearly impossible on Morane Parasol machines, where the camera, in order to avoid cutting off, must be on the outside. I arranged a suitable bracket for holding the camera, and proper boxes to hold the plates, and also built on the cameras sent a direct vision wire finder. The finders sent were of no use, and without one the amount of country included in each photograph and the proper overlapping cannot be at all correctly estimated. I carried out a number of trials in order to find the correct exposure, and, as results of some kind were urgently needed, started work.

"It was immediately apparent that the material supplied from England, though better than nothing, was not at all as good as could be got, and I reported . . . . Pilots were advised as to the proper height for flying, and photographic observers trained. The darkroom was got into proper working order and the photographs turned out quickly, and a beginning made with a tracing and filling.

"From plates exposed on one day, clear, bright prints were supplied to the Maps Office by the next day, and in some cases enlargements made. A number of trench and other maps have been made from them, and I may fairly claim that the work turned out is really satisfactory and of use to the General Staff. Observers from the 'Ark Royal' and captains of the monitors have asked for copies of many of the photographs, which they found of considerable value. No. 3 Wing has for long been photographing, but No. 2 Wing results and volume of work turned out compare favourably."

Trusting this will be found an interesting contribution to the history of the modern art of aerial photography in war.—Yours faithfully,

J. H. Dallmeyer, Ltd.

Answers to Correspondents.

SPECIAL NOTICE.

In consequence of general reduced supplies of paper, as the result of prohibition of the importation of much wood pulp and grass, a smaller space will be available until further notice for replies to correspondents.

Moreover, we will answer by post if stamped and addressed envelope is enclosed for reply: 5-cent. International Coupon, from readers abroad.

The full questions and answers will be printed only in the case of inquiries of general interest.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

F. N. G.—We have not heard of it coming on the market. Perhaps the patentee, Mr. P. J. Murray, 20, Rutland Park Gardens, Cricklewood, London, N.W., could tell you something about it.

H. P.—The most practical thing to do would be to take a week's course at the Polytechnic, where all the time—five hours a day—could be devoted to practical work. At the end of this time anyone with artistic instincts should be able to work alone.

J. W. I.—Under the Copyright Act of 1911, which came into force June 1, 1912, registration of copyright is no longer necessary. You can learn the modifications in copyright law introduced by the present Act from the manual "Photographic Copyright," issued by our publishers.

G. C.—You should write to the War Trade Department, Central Hall, Westminster, London, S.W. We think it very doubtful if you could obtain a permit, as the special prohibition of the importation of photographic goods from America was re-introduced on March 1 last.

F. J. W.—The only camera of which we have heard specially made for cinematograph portraiture is that of the Bettini Syndicate, Ltd., 17, West 44th Street, New York. Captain Bettini has devised an apparatus by which the moving pictures are taken on a glass plate, and also devices by which any given small picture can be readily shown in an enlarged form. Obviously the small pictures could be taken with any cinematograph camera.

C. W.—If reflected light only is used the lighting will be rather flat, but it will answer to give top light for standing figures. We should fix one lamp in this way so as to give a light to fall at about 45 degrees on the head, one a little lower, say, 2 ft. to one side, and one lower still a couple of feet nearer the background to give a wide light. All the lamps should have calico diffusers. You must consider this as a suggestion only, as the position is somewhat difficult.

S. C.—We do not clearly understand your question; but if it refers to a metallic lustre over the shadow portions of the enlargement, caused by age and exposure to gas fumes, about the only method likely to be of any use is to rub the deposit away with a fairly hard india-rubber. If it is a matt-surface enlargement you might try the effect of rubbing the whole of the surface with flour of pumice, the very finest pumice powder obtainable from artists' dealers. It will do no harm, and it may possibly remove what is usually a very superficial deposit.

J. M.—The plan adopted for making these photographs, and disclosed some twelve or fifteen years ago by its originator, Mr. Newton Gibson, consisted in making the exposure by a few short strands of magnesium ribbon mounted in a holder somewhat in front of the candle, and thoroughly shielded on the side towards the lens. Then, immediately afterwards, the candle was lighted

and a short exposure made of the flame. For this process it is necessary that a black background should be used. You can find a description of the whole process in a volume of the "Photogram," published during the two or three years before 1903, and possibly available at the Newcastle Library.

E. J. P.—1. Certainly, the tank method is the better for a large number of plates, and will give you as good results as dish development if your exposures are reasonably right and you pay attention to having the developer at the required temperature. 2. We advise you to use the developing formulæ of the makers of the plates. If you cannot get a tank formula from the makers you will find the ordinary dish formula will answer by diluting with three or four times its bulk of water, and, if it is found necessary on account of stain, by making up the formula with, say, twice the quantity of sulphite. The general practice is to use a developer of such strength that development is complete in from fifteen to twenty minutes.

W. L.—Your arrangement of lamps as sketched should answer very well. The indirect light, reflected from ceiling, will certainly improve the lighting for groups, but we think you should have a 1,000 c.p. lamp for this. We do not think you will always want all the eight 500 c.p. lamps on at once in so narrow a studio, so that it will be wise to have separate switches. We should prefer to have the top row of lamps to raise and lower. For standing figures, 8 ft. 6 in. at 8 ft. does not seem to give a sufficiently high light, and you cannot afford to bring the sitter forward. If you could move the lamps nearer to the background for full length it would be better if it is not possible to raise them.

M. F.—We think you may safely assume that it may be three or four years before you could count upon making a regular income of, say, three or four pounds a week out of Press photography. Portraiture business in a well-populated district such as yours would probably give you a much better return, and more speedily. The Practical Correspondence College will give you ideas as to making news photographs, or rather of thinking of incidents which might be photographed for this purpose. In the ordinary way you do not require a licence, but in many districts photographers who canvass from house to house soliciting orders for photographs and subsequently taking the photographs to the houses are required by the police authorities to have a hawker's licence. Many water companies require photographers to pay for the water by meter.

L. G.—It is impossible to say how much hypo is required for a given number of prints, because so much depends upon the efficiency with which the hypo solution is used in the way of moving the prints in it. The best advice we can give you is to use a bath until, after inserting a slip of dry-plate in it, it takes more than, say, five minutes for the white emulsion to disappear from the plate. If it takes longer you had better throw the bath away. Average strength of bath for bromide prints is 4 ozs. to 20 ozs. of water. Average strength for an alum bath is 2 ozs. of alum in 20 ozs. of water, keeping the prints in solution for from ten to fifteen minutes. We should say that the Rajar M.Q. developer would not require to be double strength for plates. It would, of course, be convenient to make it up of double strength. If you find it gives negatives which are too thin, you can easily use it stronger.

S. A.—1. The Ross 2a lens would be the most suitable one for the enlarging-box. We cannot give measurements without knowing the size to which you want to enlarge. You could take the lens out for other use at any time. (See articles in the "B. J. Almanac," etc., for details of construction). 2. We certainly recommend white blinds in addition to dark ones even with rolled or ground glass. Your builder will, we think, understand how to fit them if you show him the little book. Be sure that he does not place the four wires in one plane. The bottom row of blinds must hang clear of the top row. 3. Your idea of using old backgrounds is quite good, but we should not care for dark grey unless the walls are the same colour. A greyish green would look better with oak slats, and you could easily get ready-made distemper of this or any other colour. The slats may be rather dark oak, 3 ins. wide, ½-in. thick, and 15 ins. clear between each. If you are going to make square panels you can go up to the level of the eaves, but if only uprights with a rail on top, they should end at 6 ft. to 5 ft. 6 ins. 4. "W.Y.W." means "while-you-wait," and is usually applied to cheap postcard and midget studios.

D. F.—The marks are certainly mysterious, and we cannot say that we have ever seen any like them. The pinhole theory does not seem to us very likely, as presumably the camera was used in the hand, and so not out in strong light in one fixed position for any time. Although it may seem unlikely to you, we should be inclined to look for the cause of the marks in some part of the process after the plate had been exposed. We have seen markings something of this kind which gave a lot of trouble, and were thought to be caused by flare in the lens and bright metal in the camera, but which ultimately proved to be due to finger marks transferred from the back of one plate on to the film of another as they were stacked together awaiting development in the dark-room. We make this suggestion only on the supposition that you have thoroughly overhauled the camera in order to discover any parts of bright metal around the lens mount or near to the shutter which might give rise to an effect of this kind.

T. H.—The only studio gas lamps on the market are the "Howellite" of Messrs. J. J. Griffin and Sons, Kingsway, and the "Powerful" of Messrs. Kodak, Ltd., Kingsway, London, W.C.2. Both of these consist of a battery of some twenty incandescent lamps, in the one case inverted and the other upright. Either can be used with such ordinary gas pressures as 2 in. provided that you have a supply pipe of ample diameter and a meter to correspond. As regards high-power lamps, we do not know that any of them have been used for portraiture, and we think with you that they are only obtainable for compressed gas. You could write to a firm such as Messrs. Falk, Stadelmann, and Co., of Farringdon Road, E.C., who are the largest people in gas lamps in these high powers. In any case, you may be pretty certain that unless the studio is of ample size and very well ventilated the heat from a good size gas installation may easily be unendurable. Except at the cost of enormous heat you certainly cannot get light equivalent to a 5,000 c.p. in half-watt lamps or arcs.

The British Journal of Photography.

Line Advertisements.

Charges for Insertion.

Since advertisements cannot be inserted until fully and correctly prepaid, senders of line announcements are asked to bear in mind the scale of charges. They will thus save themselves delay in the publication of their announcements. A Schedule by which an advertisement can be correctly priced will be sent on request.

Net Prepaid Line Advertisements.

12 words or less 1/-
Extra words ... ... 1d. per word.
(No reduction for a series.)

Special Note. Box Number Advertisements.

"Box No." and office address ... ... charged as 6 words.
For forwarding replies add ... 6d. per insertion for each adv't.
If replies are called for this latter charge is not made.

Advertisements cannot be inserted until fully and correctly prepaid.

Orders to repeat an advertisement must be accompanied by the advertisement as previously printed.

Advertisements are not accepted over the telephone or by telegram.

The latest time for receiving small line advertisements is 12 o'clock (noon) on Wednesdays for the current week's issue.

Displayed Adv'ts should reach the Publishers on Monday morning.

The insertion of an Advertisement in any definite issue cannot be guaranteed.

HENRY GREENWOOD & CO., Ltd., Publishers,
24, Wellington Street, Strand, LONDON, W.C. 2.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3077. Vol. LXVI. FRIDAY, APRIL 25, 1919. Price Twopence.

Contents.

	Page
Ex Cathedra	215
Partnerships	214
Practice in the Studio. By Practicus	215
Getting Good Photographs of Difficult Mechanical Subjects. By R. Bigelow Lockwood	217
The Merits of Gaslight Papers. By J. Hall	218
Standardisation in Sizes of Small Plate Cameras	220
A Share-holding Scheme for Eastman Kodak Employees	220
Assistants' Notes	221
Exhibitions	222
Patent News	222
Analecta	223
New Apparatus, etc.	223
Meetings of Societies	224
Commercial and Legal Intelligence	225
News and Notes	225
Correspondence—	
Substitute for Acetic Acid in the Wet-plate Developer	226
The Fixation of Bromide Prints	226
The Assistant Question	227
Forthcoming Exhibitions	227
Answers to Correspondents	227

SUMMARY.

In his article this week "Practicus" deals with the handling of the studio camera, and considers at length such features as extension, focussing movements, horizontal and vertical swing back and repeating back, which make for convenience and rapidity in use. (P. 215.)

Some hints on the photography of difficult mechanical subjects, such as polished metal articles, and on the effective use which can be made in prints for advertising purposes of photographs taken from a much nearer standpoint, that is to say, upon a larger scale. (P. 217.)

In a contributed article Mr. J. Hall deals with some of the advantages of gaslight papers, and instances particular features more or less special to various makes. (P. 218.)

Mr. Albert O. Forrest has the excellent suggestion to make that a fixing bath for bromide prints should contain only so much metabisulphite as to keep the bath free from stain until its fixing powers have become exhausted. (P. 226.)

The British Photographic Manufacturers' Association has adopted a series of standard sizes for small plate cameras, a piece of policy which plainly will affect also, in course of time, the sizes of plates. The new sizes are all in the French metric measures, and it is proposed to designate these, and other small sizes still in use, by numbers. (P. 220.) We have some comments to make on this introduction. (P. 214.)

A large scheme, provisionally introduced by Mr. George Eastman, is planned to make employees of the Eastman Kodak Company and subsidiary companies holders of Kodak shares. Mr. Eastman is offering a large donation for this purpose. (P. 220.)

In forming business partnerships, personal amenability is as important a factor as a proper and formal agreement upon business matters. Both factors should be investigated before a partnership is entered into. (P. 214.)

An exhibition of pictorial photography and of colour transparencies is now open at the Hampshire House Photographic Society. (P. 222.)

The London Salon is announced to be held, again at the Royal Society of Painters and Water Colours, from September 13 to October 11. (P. 214.)

Some very practical notes on the choice of a lens according to the purpose for which it is to be used are contained in a contribution to "Assistants' Notes." (P. 221.)

A modified pattern of guillotine trimming board is among the patents of the week. (P. 222.)

EX CATHEDRA.

A Word on Intensification. We constantly hear photographers inquiring for a formula for an intensifier that will bring out undeveloped shadow detail. These do not realise that what they seek is impossible. If such detail as is in the film of the plate is not brought out by development it is lost for ever. Intensification will add to the printing density of the negative, but it cannot bring out in the film what has been never recorded during the exposure or lost through under-development. To our mind, under ordinary conditions, intensification ought never to be needed. A full exposure should be given, and the operator should know his developing agent and the requirements of the printing medium well enough to be able to produce a negative of just the right quality every time. It is only when it is required to add to the density of the negative in order to fit it for another process that intensification should be required, and even then it is quite easy to overdo this latter process and to produce a negative of excessive contrasts. A good plan when requiring some extra printing quality in a soft negative such as is made for contact bromide printing or enlarging, when prints in carbon or other process demanding a more vigorous negative are to be made, is to bleach and sulphide the plate as in sepia-toning prints. The result is that the negative is toned to a sepia which gives a greatly increased printing value. A moderate degree of intensification is obtained without the possibility of spoiling the plate that is always more or less existent with the mercuric processes.

* * *

Fixing Bromide Prints. A very bad practice, which is, unfortunately, very common, is that of allowing too large a number of bromide prints to accumulate in the fixing bath, which is in such cases generally inadequate in size of container and quantity of solution for the amount of work required. The result is that not only is there danger of uneven fixation, no matter how long the prints are immersed, but that there will be an inequality of depth and colour due to the varying times which the prints have been subjected to the action of the hypo. With some brands of paper the difference is very noticeable, while in others it is slight. This can easily be tested by taking out a print after five minutes fixing and leaving another of precisely similar depth in the bath for an hour; better still, let a print be cut in halves and the halves compared after treatment. It takes only a few seconds to remove a proportion of prints from the hypo to a dish of plain water, and this should be done at regular intervals and not only at the end of the batch. When prints are being made in dozens and half-dozens, it is easy to tell from the subjects which prints have had sufficient time. A simpler way is to have two fixing baths,

and to use them successively, when one is full of prints start on the second; when this is full remove the prints from the first dish to the washer and start this again. This obviates the necessity of sorting out the prints and takes very little time indeed as compared with the bad old way.

* * *

Quarter-plates to Go. The memorandum of the British Photographic Manufacturers' Association which appears on another page deals with a matter which has called for a long time for common action by the industry as a whole. There have undoubtedly been too many plate sizes. Their number has grown steadily—perhaps one should say stealthily—as one camera maker or another has thought fit to devise a new size or make a microscopic alteration in an existing one. What with the wide range of British sizes and a similar assortment in metric measurements the plate-maker's register of the dimensions of plates which regularly or at one time or another he is making has grown to unreasonable proportions. We were shown a year or two ago by a maker with whom we were then discussing the matter, his book of plate sizes, and were astounded as much by the variety as by the minute differences which existed in many cases. Such multiplicity is a highly uneconomical factor in a plate works, causing not only extra labour but a considerable waste of material, and therefore it is satisfactory that the Association has announced its policy of making a clean cut among the smaller sizes. It will no doubt raise some qualms that the quarter-plate and the postcard size are among those which are to be displaced, but we imagine—it is in fact suggested—that the change will be gradual and that plates of the abandoned sizes will cease to be made in proportion as the cameras of these sizes disappear. A further point to be noted is that metric sizes have been adopted, a change which will simplify manufacture for the foreign amateur trade. The quarter-plate is to be replaced by one of 8 by 12 cm., the latter a little narrower and distinctly longer, so that its shape is more in accordance with what has been regarded as suitable for the average class of amateur subjects during the past few years. As regards the introduction of a system of identifying each size of plate by a number in place of the specification of its dimensions, we have our doubts. We think that errors are more likely to be made on this system than on the old one, where, if a mistake is made in one figure, the remaining ones suffice to identify the size that is meant. The suggested system unfortunately does not embody this element of security for which, in view of the liability to clerical errors in typewritten indents, there is a real necessity. People can remember names like "vest-pocket" and "quarter-plate," but if they trust to memory in the case of a series of numbers from 0 to 9 they are liable to make mistakes.

* * *

The P.P.A. The Council of the Professional Photographers' Association have not done a very wise or discreet thing in letting the announcement of the change in the honorary secretaryship take the form of the brief intimation which appeared in our Corespondence column last week. We do not know what were the causes which have precipitated the change, and we prefer not to speculate in public on the matter. Even assuming that relations had become as strained as the event suggests, it should have been possible to have avoided the sudden rupture and the questions which it arouses. No good, but the reverse, is to be gained by a discussion of the circumstances which have caused Mr. Mackie to disappear from the secretaryship of the Association, which he has held for it must be twenty years. He was one of the founders of the Association, has been its most thorough-going supporter ever since, and whatever conflict there may have been of late between his own views and that of the Council, a measure of harm has been done to the Association by the precipitate manner of his departure. That is all that we have to say on the incident, and to us it appears all that should be said. The sooner the matter is forgotten the better.

* * *

The London Salon. The exhibition arranged by the London Salon of Photography will be held again at the Royal Society of Painters in Water-Colours, 5a, Pall Mall East, London, S.W., from Saturday, September 13, to October 11. The latest day for sending in exhibits has been fixed for Tuesday, September 2. The entry form and prospectus are now in course of being printed and may be obtained on application to the Secretary at the Gallery. Here a reminder may be made to intending exhibitors abroad that the Salon is particularly anxious to secure a representation of current pictorial work from those in distant parts of the British Empire and in non-enemy countries. In the case of such exhibitors the work should be sent mounted but unframed, and it is then prepared for exhibition by the committee in accordance with the plan which has been adopted for some years past—of placing them under glass on the gallery walls.

PARTNERSHIPS.

As it is possible that at the present juncture many demobilised men and others will form the idea of joining their resources with those of another party with a view to commencing in business as photographers, a little seasonable advice may not be without value to those inexperienced in such matters. There are two outstanding questions which have to be satisfactorily settled if any successful co-operation is to be expected. They are the personal character and habits of the parties and the legal conditions of the partnership.

With regard to the first point, it is a melancholy fact that within a few months men who have previously been the best of friends have become bitter enemies, or at least have such strained relations that the position has become almost intolerable. It is therefore necessary that the closest inquiry should be made not only into the general character of a prospective partner, but into his ordinary habits. Perhaps an actual instance may explain more clearly what we mean. Two young men who had met in local circles as members of a cycling club determined to start a small manufacturing business together. The one was a steady, industrious man with first-rate practical knowledge, the other had several years of office experience and was in his way as steady and reliable as his partner. The business man furnished the bulk of the capital, and was entrusted with the task of selling the products of the concern and generally conducting the business management. This would appear to be quite a proper and workable arrangement, but it soon broke down. The capitalist soon took the view that his investment was sufficient to justify irregular attendance at the business premises, and finally the other partner found himself saddled with the job of keeping the books, interviewing customers, and other routine work, with the inevitable result of a compulsory liquidation. In another case a partner caused disaster by overdrafts on the business for private purposes, with the same unhappy result. Further than this, some men, when they find themselves their own masters, develop intemperate and other undesirable habits, which, if they previously existed, were carefully concealed. Unfortu-

nately these traits are not easy to detect in a man one has met at a club, lodge, or even a church, and yet their possibility must be recognised. Even the temperament should be carefully studied, for a touchy man, whose dignity is easily wounded, will not sort well with a jocular partner, nor a slovenly worker with one who is the soul of precision.

To come to the legal aspect of a partnership, there are a few important points to be observed. One is that each member of the partnership is individually liable for the entire debts of the partnership or for any claims or awards which may be made against it. The only way to guard against this is to make the concern a limited liability company, a rather troublesome and costly proceeding. Another point is that the partnership is liable for the acts of any of its members in the way of contracts, agreements, or quotations.

It will therefore be seen that it is very desirable to have a thorough understanding upon all points which are likely to arise before a partnership is entered upon, and this should be embodied in a proper deed, drawn up by a solicitor, and properly stamped. Some points in such a document would be the objects of the partnership and to what sphere its operations are to be limited; the amount of cash, stock, or apparatus to be provided by each party, with the time and manner of its delivery, the duties of each party, with provisos as to holidays, absences, etc., the amount to be drawn by each as salary, and the ratio in which further profits are to be divided, the conditions under which a dissolution of partnership can be claimed by either party, or, in the case of death, the payment based upon the makings of the business and value of the assets to be paid to the deceased partner's estate or to remain as a charge upon the business. The limitations of the individual powers of the parties should also be clearly defined, so that if one exceeds them the other should have proper ground of action against him.

Other points caused by individual conditions would probably be suggested by the lawyer, and embodied in proper legal phraseology. The ordinary man often laughs at this, and thinks it cumbrous and out of date, but he may find too late that the ordinary loose style of commercial correspondence can often be interpreted in more than one way. Even a Lord Chancellor's will has had to come before a probate court for elucidation; much more therefore may a layman be expected to trip over wording an agreement.

The existence of such a document prevents much discussion and perhaps squabbling after operations have been started, and it can always be referred to if there is any danger of its provisions being ignored. No honourable and reasonable person would object to it, and in itself it furnishes a test as to the bona-fides of the signatories. It is also invaluable in the case of the death of either of the parties. We all know men whom we would trust with our last penny and with whom we could work harmoniously in sunshine or shadow without a written bond, but such men may have undesirable heirs whom perhaps the surviving partner has never seen nor heard of, and when these appear on the scene some such protection is needed.

We have assumed in the paragraphs above that both partners are working in the business, but there is another class, commonly known as sleeping partners, who provide the money necessary for starting a business or some portion of it. These people generally secure themselves against full liability for the debts of the business by becoming "limited" partners, by which means their liability is limited to a certain amount. An agreement is equally necessary in such cases, and our advice is that each party should engage their own solicitors, so that no clause to the detriment of either should be allowed to pass. Very onerous conditions may be imposed without being understood by an unsophisticated person, but which the trained eye of the lawyer would quickly detect.

PRACTICUS IN THE STUDIO.

[Previous articles of this series, in which the aim of the writer is to communicate items of a long experience in studio portraiture, have appeared weekly since the beginning of the present year. It is not thought possible to continue the series to the length of that by the same writer which ran through the "British Journal" some years ago, but if any reader among the younger generation of photographers, and particularly those engaged as assistants, has a particular subject which might be dealt with, his or her suggestion will be welcomed. The subjects of the previous articles of the series have been as follows:—

A Talk About Lighting (Jan. 3).
The Camera and the Lens (Jan. 10).
Managing the Sitter (Jan. 17).
Backgrounds (Jan. 24).
Studio Exposures (Jan. 31).
Artificial Lighting (Feb. 7).
Printing Processes for Portraiture (Feb. 14).
Studio Accessories and Furniture (Feb. 21).
The Surroundings of the Studio (Feb. 28).
Studio Heating and Ventilation (March 7).
The Postcard Studio (March 14).
The Printing-Room (March 21).
About the Reception Room (March 28).
Home Portraiture (April 4).
Portable Studios (April 11).
Copying (April 18).

HANDLING THE STUDIO CAMERA.

In a previous talk I touched but briefly upon the principal points of the studio camera, without reference to its manipulation, and I will now deal further with the various parts and adjustments of this most important item in the studio.

A studio camera differs from other patterns inasmuch as compactness and portability are disregarded, adaptability to the special purpose for which it is built being the sole point which its designers have in view. Bellows extension is one of the first things to be considered in a modern camera, for it is now the fashion to use lenses of much greater focal length than were in vogue a century ago. For ordinary cabinets a sixteen or eighteen inch lens is commonly used, so that for a camera to be used for nothing larger than half-plates an extension of twenty-two or twenty-four inches is needed, unless one uses such a lens as the Telecentric, the largest size of which only needs a length of about eleven inches from flange to focussing screen for distant objects, while the equivalent focal length is seventeen inches. For near objects the extra extension needed is the same as for the ordinary type of lens. A safe guide in selecting a camera for a given lens or *vice versa* is to have the bellows extension about 50 per cent. longer than the equivalent focal length of the lens. This will allow of an image half life-size being obtained, which is now seldom exceeded. A full life-size requires an extension double the focal length of the lens. In cases where extra extension is needed a box front which will slide into the grooves provided for the rising front is useful; while, if it is

made so as to be reversible, extremely short focus lenses may be used as well. Most modern cameras have ample extension without such additions.

Focussing is usually done by rack and pinion, and a screw clamp is often provided to prevent the back from moving when inserting the slide. This indicates the weak point of the racks as usually fitted. If diagonal racks were used there would be little risk of movement. I much prefer the old winch screw system, as with this the handle is always in the same place below the focussing screen, and when you let go of it it "stays put." Moreover, cameras fitted in this way usually have no projecting tailboard, a great advantage with fairly short focus lenses. Another method of focussing, fitted, I believe, to American cameras only, consists of a pivoted lever which moves the camera back an inch or two either way, a screw clamp fixing it when the image is sharp. If greater range is needed it is obtained by sliding the back; the arrangement works smoothly, but comes a little strange to those accustomed to other methods.

The rising front is a simple affair, but for some reason is used by few operators. It is useful for full-length portraits when it is not desirable to tilt the camera too much to place the figure properly upon the plate. The front is usually lifted by hand and secured by a thumbscrew, but it would be a convenience if it could be operated from the rear, as is done with some of the best process cameras.

The swing-backs, horizontal and vertical, are important adjustments, but they should be used with discretion and not brought in unless absolutely needed. It should be remembered that their function on a studio camera is the reverse of their general function in outdoor work. Indoors they are not used to correct the lines, but to bring different planes of the subject into sharp focus without reducing the aperture of the lens. This is always effected at the expense of proper perspective, and when it is possible to obtain sharpness in any other way they should not be used. If we take a sitting figure with the hands in the lap, the latter may be brought into focus either by using a smaller stop or by swinging the top of the camera back outwards. In the former case they appear in proper perspective; in the latter they will be larger in proportion than they should be. The use of modern anastigmats which have a flat field has tempted many people to use the swing as a matter of course. Many of the old portrait lenses had deeply curved fields with very little astigmatism, and these would give uniform sharpness with a sitting figure, even with as large an aperture as f/3, without using the swing. No depth is gained by swinging, so that, although the face and hands may be sharp, the waist is usually much out of focus. It is nearly always necessary after adjusting the swing to give a final adjustment to the focus by the ordinary rack or screw, so as to equalise the definition as much as possible.

The swing adjustment is controlled in various ways, the simplest being a clamping screw on one or both sides of the back frame, and this is perhaps as good as any. Most good cameras are fitted with rack adjustments to the swings, but they are liable to work too easily, and if not clamped by a second screw allow the back to shift while inserting the slides. With care this cannot happen, but one is apt to rely upon the rack holding and to forget the clamp. A better adjustment found upon some American cameras is an endless screw working upon a curved rack. This is always holding and requires no clamping, besides being capable of very delicate adjustment. It is altogether the best fitting for the purpose I have used, and British makers would do well to adopt it.

I was recently told that a certain camera which I was handling was not a studio camera because it had no repeating back—that is to say, the slides were arranged for only one exposure in each. This shows the importance some people attach to small details. Certainly most studio cameras are fitted with a repeating movement, so that two exposures may be made without removing the slide from the camera, but I am not at all sure that the plan is a good one. For one thing, it increases the chance of double exposures, and the slides are made heavier than need be. I much prefer the American plan of one slide, one plate, and of a special fitting made to carry the small slides. It can be only our innate conservatism that perpetuates the clumsy procedure of a focussing screen separate from the slide, a slide shutter which has to be opened, and a lens shutter which has to be closed before the slide can be drawn. For many years the Americans have had the focussing screen and dark slide upon one moving frame, with an arrangement for automatically uncovering the plate, but even they did not complete the arrangement by making the exposing shutter an integral part of the back. This was, however, done some years ago by Messrs. Dallmeyer in an attachment in which the action of pushing the slide into position left everything ready for exposure, so that only the two movements were necessary to make an exposure—namely, sliding the dark slide into position and pressing the rubber ball. For some reason this apparatus has not come into general use, and will probably not do so until the Americans rediscover it and put it on the market again.

With regard to single slides it would be very convenient if they were to be fitted with adjustable bars to take any sized plate instead of loose inner frames. This is common in process cameras, and would be equally convenient for portrait work. This is a fitting place to give a reminder that the velvet slips in the back frame of the studio camera, and also inside the slides themselves, soon get worn or flattened down, and that plates get fogged in consequence. New velvet strips should be fitted at least once a year, and perhaps oftener in busy studios. As many slides as can be afforded should be fitted to the camera, as it is a great saving of time to have at least a dozen plates in the slides at once. One well-known man has a hundred single slides which are all filled when he begins the day's work, and they are replenished as needed. It may seem a big outlay, but such slides need not cost more than ten shillings each by the hundred, and in a big business they would earn their cost in a year.

There are still a few studios where the exposures are made with the old-fashioned cap, but I cannot understand why, as it seems to me that any shutter which would work at all would be preferable. There have been many models of studio shutter on the market, and there is still a good choice. I have tried most, and prefer the simplest, either the single or double velvet flap or the Packard Ideal. The great trouble with most is the rubber release—the ball, tube, and bellows. When new there is nothing better, but when one or the other becomes leaky there is a constant worry. Either the shutter will not open, or if an exposure of more than five seconds is needed the flap begins to drop, and uneven exposure results. Fortunately the Bowden wire or "Antinous" release has solved the problem, and the last objection to the shutter vanishes. It is a good plan to have a long tube or wire, so that when photographing children or animals the exposure may be made while the operator is a good distance from the camera.

Of the studio camera stand there is not much to be said, except that most models do not give sufficient range in height. Anyone who photographs children must feel the desirability of lowering the camera so that he can pose his little sitter on the floor. This is impossible with the ordinary three or four-pillar stand, so that a platform table or other piece of furniture has to be used, but with a two-pillar stand of the Semi-centennial or Hana type the lens can be brought down to less than two feet from the floor, and the work is made much easier. Racks for dark slides are sometimes fitted to studio stands, and are to be recommended, as there is then no running about to pick up another slide during a sitting. Another useful fitting is a clip or pocket to hold the focussing magnifier ready for instant use.

Sufficient attention is not given to shading the camera in

many studios. It is a good plan to have a light frame erected upon the camera stand to support the focussing cloth in such a way that it projects a foot or more over the lens, and a like amount behind the focussing screen. This serves the twofold purpose of shading the lens and of keeping the focussing cloth from dragging the hair, a consideration to the many lady operators we now have. I have worked in a canopy which ran on wheels on the floor, the camera being inside. No focussing cloth was needed, and it was a luxury to work it. It has, however, the disadvantage that one had either to keep behind the camera all the time or to come outside to make any necessary adjustment of the sitter.

PRACTICUS.

GETTING GOOD PHOTOGRAPHS OF DIFFICULT MECHANICAL SUBJECTS.

[In the paper which we reprint below from "Printers' Ink" some good advice and suggestions are offered to commercial photographers by one who looks at the making of photographs of technical goods from the standpoint of the seller or advertiser.—EDS. "B.J."]

A CERTAIN commercial photographer recently made the remark that he would rather photograph almost anything else than a polished steel ball, which bears out the contention that the simplest mechanical objects are often the hardest to photograph.

That the inoffensive polished steel ball can store up trouble for the photographer and bewilderment on the part of the advertiser who sees the finished print, is attested to by a case which not long ago came under the observation of the writer. It was desired to show a life-size picture of a steel ball about three inches in diameter, and the advertiser insisted upon retaining the highly polished surface as an argument in favour of accuracy and finish.

Accordingly, the ball was carefully polished with chamois to a high degree of brilliancy before being placed in position in front of the camera. The result, as shown by the print, was startling. Every detail of the interior of the studio was faithfully reproduced on the surface of the sphere, including the skylights, furniture, and those who happened to be standing behind the tripod watching the taking of the picture. And directly in the centre of the ball was a dark object which proved to be a perfect miniature of the camera itself. The impression of a steel ball was absolutely lost in the maze of reflections.

A second trial was made by coating the ball with a thin film of putty, but this had the effect of deadening the high-lights and causing the object to resemble the exterior of an egg in texture. Various ways were tried to catch the proper effect without lending an air of grotesqueness, and finally the following method solved the problem:—

The ball was placed on a small pedestal and surrounded with a square frame covered with white cheese-cloth and open at the side toward the camera. The entire camera was then covered with cheese-cloth, a small hole being cut for the lens. This arrangement diffused a pure white light over the surface of the ball, free from reflections, yet preserving the high-lights which the coating of putty had killed. The result was perfectly satisfactory, and brought out the polished surface minus the distortion formerly caused by the reflected image of the studio and its properties.

It may be said here that this simple method of killing reflection is ideal for the photographing of small mechanical objects in general—such as small tools, wrenches, taps, dies, etc., where the problem is to retain polished surfaces without the evil of reflection.

That the method is successful is further proved by the fact that if properly surrounded by cheese-cloth, and the camera properly covered with the same material, it is possible to photograph a large garden globe without catching reflections.

The greatest ally of the camera is the air-brushing outfit, but how generally is it known that for the photographing of small objects a judicious preliminary use of "air" *applied to the subject itself* will often help to bring out details which otherwise would be lost? For example, the advertiser who wishes to photograph a watch fob in the form of a medal can many times bring out the design by first squirting on a little air over the surface of the metal. And likewise the practice of chalking the raised name of a machine on a casting will bring out the name strongly in the picture.

These are common tricks of the studio, but the purpose of this article is to place before the reader certain practical points regarding the taking of pictures of difficult mechanical subjects, and preparing these photographs for the copy, rather than to attempt to cover the intricacies of a profession. The usual advertiser is not a photographer, but rather an individual who has in mind certain results, and is often at a loss regarding how best to get them.

When it comes to the taking of shop pictures showing machines at work, it should be remembered that the commercial photographer is rarely a shop man, and hence needs proper direction; not in the matter of *how* to take the picture, but *what* to take. It is the business of a good photographer to study his lights and to calculate the duration of his time exposures rather than to sense the value of some extraordinary heavy cut being taken by a tool.

The truth of this was forcefully brought home to an advertiser of a line of machine tools who secured permission from various users throughout the country to send a photographer to their shops for the purpose of taking pictures of machines in operation. Twenty-five shops granted the request, and a copy of "Bradstreet's" furnished the names of photographers in the different cities. These photographers were written to and told to "get some good pictures of the machines in action."

The results were disappointing in the extreme. From the standpoint of good photography, the pictures were excellent, but almost without exception the views were taken without regard to the value of the work performed. The camera had been set up and the pictures shot with no definite purpose in mind other than to secure a picture of the machine. In many cases the cutting tools were hidden or else the machine was engaged in some freak job inadvisable to advertise. It was obvious that the governing factors had been the direction of the light and the space, rather than an appreciation of the mechanical value of the job and the method by which it was being handled.

Taking this spoiled lot of prints as a guide the concern tried again, using different methods of approach. This time the letters asking permission stated frankly that the photographer who would call was not mechanical, and asked that the company turn him over to the shop superintendent or someone familiar with the work of the machines who could properly direct the picture-taking. The result was a complete reversal of the former experiences, and a valuable quantity of really informative prints was secured. Full particulars regarding the jobs were later secured by sending duplicate prints back to the various shops, with the request that the data be written on the back and the pictures returned.

In preparing shop photographs of this kind for copy, a good lesson may be drawn from the "movies."

Perhaps one of the most appealing tricks of the screen is the "close-up" in order to get the proper emotion across. A scene is flashed showing Marie Bickford standing at the old gate waving a tearful farewell to her lover who is en route to make his fortune in the great city. Marie is too distant to register tears, so a "close-up" is flashed of Marie's face filling the whole expanse of screen and filling the hearts of the audience with her pearly flow of teardrops. Or perhaps the hero receives a telegram. Feverishly he tears it open and then clasps an open palm to his high forehead. What is in it? (We're speaking here of the telegram.) The question is answered by a "close-up" of the sheet telling us that Vivian has eloped with the Count de Varville.

Excellent results along somewhat similar lines, only put to more practical purpose, may be attained in the photographing of machine tools where it is desired to impress the reader with the action of the cutting tools at work on a job, the ease with which the shifting of a lever throws out the gears or the mechanical details connected with some particular part of the machine. As in the case of Marie Bickford, whose distance hides her tears from the close inspection that calls forth the sniffles, so the usual photograph of a machine fails to focus attention on any particular detail, and the point desired to be brought out is hidden in the picture of the machine as a whole.

Right here is where the "close-up" is useful. This "close-up" may be an enlargement of a small section of the big picture, or perhaps it represents another shot, taken at close range, of the cutting tool or detail of the machine to which particular attention is to be called.

In order to get the best effect the "close-up" should be trimmed in the form of a circle and implanted partly on the face of the big picture, encroaching upon the white space to avoid confusion between the two pictures. It is also advisable to define the outline of the circle by a thin band of grey or white where it overlaps the main picture.

Another effective treatment in handling the "close-up" is to bring it entirely outside of the main picture, and carry an arrow down to the section of the machine of which it is an enlargement, in order to tie the idea together and link the close-up to the main photograph.

After a picture has been taken, it usually remains for the retoucher to put on the necessary finishing touches before the engraving can be ordered, and right here exists a degree of misconception in some quarters regarding the way to judge good retouching.

A certain retoucher of exceptional ability who specialises on retouching photographs of mechanical subjects tells a somewhat amusing incident which illustrates this point. It appears that upon presenting a number of retouched photographs to a client the advertiser found fault with the charges, claiming that the prints did not show much retouching, and consequently the work was not worth the price. And by way of explanation the retoucher was informed that a good retouching job was "laid on thick."

It took some diplomacy to clear away this erroneous standard of valuation, and to convince the advertiser that the retoucher commanded high prices because of the *little* "air" he used rather than the quantity. Almost any dud can smear on a thick coating of Chinese white, but the mark of the expert lies in his knowledge of how *little* retouching to use in order to get the most out of the subject. The gifted retoucher lets well enough alone wherever possible, and uses his air sparingly.

The camera is yet to be discovered which will photograph what is going on inside of a sealed gear box or catch the action of the whirling jets of steam in the heart of a turbine. And yet, for advertising purposes, it is often highly desirable to show the interior workings of a closed chamber—hence the ghost cut.

To execute a phantom view of a difficult mechanical subject properly calls for a display of the highest retouching skill, coupled with some engineering knowledge or leaning toward mechanics. It is customary to have the parts normally unseen and a well-finished job represents no small effort.

The final step in preparing photographs for copy lies in determining the size (unless the size of the finished cut has already been planned for at the time of retouching).

It would appear almost unnecessary to caution care at this stage of the game, when the entire desired effect can be spoiled by ill-considered cropping, but many good photographs have been wrecked on this rock of carelessness. For example, nothing but gross inattention can be responsible for cutting off a machine-tool operator's head just above the eyebrows. Far better to reduce the size of the picture slightly than to crop without regard to anatomy. Better to leave an additional operator out of the picture entirely than to bisect him horizontally.

Readers of technical papers are looking for the picture to tell them just as much as the copy. They are looking for clearness, accuracy of detail and atmosphere. Pictures, to them, are as interesting as the photographs in your newspaper, and a "close-up" of some new tooling method capable of saving time and money does not lack the inspection for which it was created.

See to it that they are not disappointed. A really good photograph is worth all the time and trouble it takes to get it.

R. Bigelow Lockwood.

THE MERITS OF GASLIGHT PAPERS.

Gaslight papers, in spite of their many alleged shortcomings and disadvantages, are well worth the thoughtful consideration of professionals. After a close study of many of the leading makes I am convinced that they are in many ways superior to, and more useful than bromide papers, and I will do my best to explain my convictions. For ten years I used bromide paper of various makes and kinds, and I had got to believe it was the one and only process; true, it scarce equalled platinum, but it would give a colourable imitation from an inferior negative, and that was good enough, I thought. The depth and quality of carbon was also a bit out of reach, but I considered the other advantages of bromide to outweigh this, and so was satisfied without carbon. Gaslight paper I never thought of, only as a process for tyros, a means of producing multi-coloured prints whose chief properties were blobs and stains; prints which always seemed to shriek out "Pot. brom.," until one day I saw some good gaslight work, which I promptly accused of being carbon! This set me thinking, and I sought a closer acquaintance, the results of which I set down here for the benefit of any professional who is seeking fresh styles or new effects.

To begin with, let us consider the bad points of gaslight emulsions, after which it will be easier to judge of their merits. The chief disadvantages are low speed, partiality to certain formulæ, poor keeping qualities, small latitude, and liability to stain.

The low speed can be counteracted by the use of a powerful printing light; for instance, Messrs. Kodak's Velox Cabinet uses a mercury tube with which exposures are extremely short, the one tube serving four printers. The partiality to particular formulæ—very often alleged by the makers—is something I never understood. Personally, I find gaslight papers quite as amenable as bromides in this respect, but of that more later. Many gaslight papers do not keep so well as bromides, but if obtained direct from the maker and well stored there is little to fear on that score. The question of latitude is a big one; some makes have very little, and

so require expert handling, as they develop fairly quickly. This means also greater precision on the part of the person developing. This characteristic should mark the paper as one for professional use rather than amateur. Many gaslights, however, have a very great latitude.

The liability to stain is due to insufficient care in handling very often, though certain brands will not stand any forcing. The use of hydroquinone also causes stain occasionally, and in spite of the fact that M.-Q. is the generally used developer for these papers, I have always found amidol give as good—if not superior—results, using only plain hypo for fixing.

To turn to some of the advantages to be derived from the use of gaslight papers. First there is the very low risk of fogging. Instead of working in a dark-room, with only a dim yellow glim, the printer can have a comparatively well-lit room; one or two 16 c.p. globes fixed fairly high will be quite safe. The comparative want of latitude can also be turned to advantage, for not only does it make for greater precision in working, but it means that prints will be good or bad, no uncertainties like bromide gives: "not quite right, somehow, but it will pass." A gaslight print that is not quite right won't pass; the result is that gaslights turned out by professionals will all be good. Another advantage is the quality obtainable from almost any negative. The really perfect bromide print is nearly always from a nearly perfect negative; on the contrary, owing to its ability to produce a false scale of gradation the gaslight emulsion will give a perfect print from a very imperfect negative. It is very necessary, however, to choose the right make and grade of paper; for example, contrast Cyko would be useless for a negative which was too "boney" for bromide, such a negative requiring Velox soft, Gravura No. 1, or Noctona. This latter, as it happens, is not specially intended for hard negatives; nevertheless, it will give fine prints off them if used correctly. For fine results off flat or fogged negatives Wellington's S.C.P. vigorous, Gravura No. 2, or contrast Cyko will surprise; all of these will tone—I find hypo-alum best—the Cyko giving an exceedingly rich Vandyke brown. I do not say it tones better than the English papers (Cyko, I believe, is American), but it is different, and it is among the many differences of gaslight papers that every professional can find something distinctive. The studio out for new effects might with advantage try using "Yto" development paper for contact work, and Wellington's B.B. for enlargements. This would be a distinct remove from the bromide work of an opposition business.

Having said so much for the possibilities of gaslight papers, it will be as well to mention a few of the characteristics of the papers named. The following, it will be understood, are observations made in the actual use of the papers, and may not fully agree with other writings. The developing agent used was amidol, the formula being sulphite 4 oz., amidol 120 grs., water 80 ozs. The special formulæ given in makers' instructions were also tried with success, though I usually diluted them.

Gravura No. 1.—In the satin surface this is an exceedingly fine paper for portraits. It has a fair amount of latitude, will stand some forcing, and yields good tones.

Gravura No. 2.—One of the two most vigorous papers I ever used. This grade will give bright and luminous results off fogged negatives. It requires careful exposing as the scale of tones alters with over-exposure. Can be used for normal negatives if developer is diluted to balance increased exposure. Both the above yield a very fine colour if plenty of bromide is used.

Velox Soft and Vigorous.—What I have said of Gravura applies also to Velox, though, in my opinion, vigorous Velox requires a rather better negative.

In Noctona we have a gaslight paper of a different sort. To treat this paper as Gravura might lead to disappointment. Noctona will suit a variety of negatives, and will give different results from any one. The rule is, big exposure for contrast, less exposure for softness, the development of contrasty prints being very rapid, so rapid, in fact, that a big saving is realised in developer while the work is merciful to eyes and fingers—less strain and stain. Noctona gives a very pure black and white; for toned prints it requires a decent negative, Noctona gives fine "P.O.P." tones.

Contrast Cyko.—Keeps and works well without any special care, but it requires a hopeless negative. From an extremely thin, watery affair it will give a first-class print. It is about as vigorous as Gravura No. 2, but slower.

"Yto" Development Paper.—The chief points of this paper are its durability, latitude, and ease of handling. The formulæ with which it can be treated are numerous, and it will stand exposures from one to six without spoiling. The makers claim that any colour can be obtained on this paper (from black to brown and red direct), but I have not tried it out so far. The brown-blacks, olives, and dark browns I have obtained, simply by forgetting to time the exposure, were so pleasing that I kept to them. Yto is a stout paper of good quality.

Wellington, Rajar, and Criterion gaslight papers come more or less within my remarks on Gravura; the former two I have only used for pure black and white and sepia; Criterion I have used for olive-black prints.

While papers like Wellington B.B. Rajina and Vitegas are not gaslights, they are worthy of mention as having some points in commomn. All three will give soft blacks different to anything obtainable on bromide paper. They also give fine shadow effects, and can be used for enlarging with the ordinary bromide enlarging apparatus, giving very superior results. Only a few days ago I saw some Vitegas enlargements which had been hypo-alum toned. They were indistinguishable from first-class P.O.P. directs. Bromides from the same negative were harsh in comparison. Any of the above-mentioned gaslight papers, or any others, can be used for enlarging if a good light source is available. With mercury vapour or daylight and a fairly thin negative the exposure will not be over a minute or two; it may be less. The results are often striking, particularly if the negative is a very weak one. The choice of paper here is even more important than in contact work, and to produce exactly the result one wants, needs some little acquaintance with the paper used.

There are other good gaslight papers beside those I have mentioned. Slogas, for one; but it is manifestly impossible to describe them all. It would take too much space, so I have confined myself to those with which I am most familiar, and trust the reader may find some little bit of useful information herein.

There is just one more point, and that refers back to staining. Forced development and careless fixing sometimes produce yellow and pinky stains. These will nearly always give to weak Farmer's reducer; a dip into hot hypo-alum will also remove them. Over-developed prints will sometimes reduce with Farmer's, the result being better than a correctly developed one. I have treated Noctona in this manner to obtain extra vigour.

Overdeveloped and reduced prints, if toned, yield decidedly warmer colours than the usual.

J. Hall.

Lancashire Society of Master Photographers.—In making mention last week of the request for prints to be included in the exhibition by members at the Art Gallery, Blackpool, next month, an error was made in regard to the mounting of the prints. These should be sent mounted (not unmounted, as stated), but they should not be framed. The last day for the receipt of entries by the honorary secretary is Monday next, April 28.

A Professionals' Firm.—A firm of manufacturers of professional photographic apparatus which has hitherto marketed its goods only to the wholesale houses, but is now approaching professional photographers directly, is Messrs. Brodrick, of 50, High Street, Charing Cross Road, London, W.C.2. Mr. Brodrick is, as we know, familiar to many professional photographers from the work which he has done in all parts of the country in the way of the design, erection, and decoration of studios and studio premises. In the making of apparatus he has shown himself no less alive to the requirements of the portraiture business. Certain of his specialties, such as the various forms of display table, bromide printer, etc., are no doubt familiar to many readers of these lines. With the conclusion of the war, during which his firm, under unimaginable labour difficulties, has carried out several important contracts for the supply of enlarging easels, developing tanks, and other accessories to the R.A.F., is now turning its energies again to the production of apparatus for professional work. One such, a drying cabinet, is described on another page. Another specialty is a developing tank of particularly good qualities; others are enlarging easels, half-watt installation of a special kind, printing boxes, and studio furniture.

STANDARDISATION IN SIZES OF SMALL PLATE CAMERAS.

The British Photographic Manufacturers' Association has now decided to adopt the following standard sizes in small plate cameras :—

New Size.		In place of
4½ x 6 c.m.	.....	Multitude of small sizes.
6½ x 9 c.m.	.....	3½ x 2½in. and 6 x 9 c.m.
8 x 12 c.m.	.....	¼-plate and 9 x 12 c.m.
10 x 15 c.m.	.....	5½ x 3½in., 5½ x 3¼in. and 9 x 14 c.m.

All camera makers are respectfully requested, in their own interests, as well as in the interests of the industry as a whole, to make all their new models in these sizes in preference to the current sizes.

In order to obviate the difficulty of describing sizes by dimensions, the following numbers to designate each size of plate have also been adopted :—

4½ x 6 c.m.	No. 0
6½ x 9 c.m.	No. 1
3½ x 2½ in.	No. 2
4¼ x 3¼ in.	No. 3
8 x 12 c.m.	No. 4
9 x 12 c.m.	No. 5
5 x 4 in.	No, 6
5½ x 3½ in.	No. 7
10 x 15 c.m.	No. 8
6½ x 4¾ in.	No. 9

Thus, a camera constructed to take plates 8 by 12 c.m. would be termed No. 4, and so forth. The trade names adopted by manufacturers can quite well be used in conjunction with the standard numbers as in the following example :—

Nemo No. 2/4 equals model No. 2 in 8 by 12 c.m. size.
Nemo No. A/4 equals model A in 8 by 12 c.m. size.

No manufacturer is asked to discontinue making any of the existing sizes, it being considered that the adoption of the standard sizes for all new models will, in time, render the older sizes obsolete.

Tripod Bushes.

The Association has also adopted the principle that all cameras should be fitted with tripod bushes, either of the two following sizes :—

1. ¼-Whitworth (standard).
2. Continental thread ¼-Whitworth (standard insertion).

The advantages to be derived from standardisation will be obvious to every manufacturer; indeed it is acknowledged to be the prime factor in economical production, and the Association looks with confidence for the support of the whole trade in this progressive movement.

A SHARE-HOLDING SCHEME FOR EASTMAN KODAK EMPLOYEES.

Particulars are given in the Rochester "Post" of April 4 of a large scheme under which employees of the Eastman Kodak will, by sanction of the proprietors of the company, become shareholders.

Nearly 11,000,000 dols. will eventually accrue to the benefit of the employees under this plan just worked out by Mr. George Eastman and the company. Mr. Eastman is to give 6,000,000 dols. worth of stock outright. This stock will be sold at par to employees who have been with the company two years or longer. The proceeds from the sale will be turned into the employees' benefit fund.

Another 6,000,000 dols. will be set aside by the company itself to be sold to the employees at par. The proceeds from this sale will go into the company's treasury. All dividends from the stock will go to the employees who purchase the stock. The proceeds from the sale of the stock given by Mr. Eastman, having been placed in the welfare fund, will be used for the benefit of all the employees, purchasers of stock as well as the others.

The 6,000,000 dols. gift of Mr. Eastman and the 6,000,000 dols. from the company represent the market value of the stock. As time goes on, more and more employees will be entitled to the privilege of purchasing the stock at 100 dols. a share. More than one-half will be permitted to participate immediately. Each purchaser agrees to hold his stock for five years. The stock is quoted on the Rochester Stock Exchange at "591 bid." The present gift to the employees will not affect the wage dividends, which are to be continued as usual.

The plan was submitted by Mr. Eastman to the directors of the company, who approved of it. In the letter to the directors from Mr. Eastman, published below, the plan is described in full. It is estimated that half a million dollars additional will be distributed among the employees each year at the start, but this will gradually increase as more and more become entitled to part ownership in the company.

The condition that employees hold the stock five years is made because it is the intention to keep these highly profitable shares in the hands of the employees and thereby fully demonstrate to them, over a five-year period, the advantages of receiving dividends from past savings. It is believed that at the end of five years of experience with the stock there will be very few of them who will be willing to sell their holdings.

Provisions are to be made to help those employees who cannot pay for the stock at the time it is allotted, to pay for it through the application of their dividends and other savings. At the present rate of earnings the dividends alone would complete the payment for the stock in from two and one-half to three years. Mr. Eastman has made ample provision for safeguarding the interests of those who for any reason leave the company's employ within the five-year period.

The communication from Mr. George Eastman to the board of directors of the Eastman Kodak company, in which he states his plan for the sale of common stock of the company to employees at par, is as follows :—

"For some time I have had in contemplation a plan for recognising my personal obligation to the loyal wage-earning and salaried employees of this company and its allied companies who have helped to make our business a success. This plan, briefly stated, involves a contribution by me of a substantial amount of common stock to be sold at par to such of the employees above referred to as have shown their loyalty to the company by length of service, the money derived from the sale of these shares to the employees to become a part of a welfare fund to be created for the benefit of all the employees and administered under rules and regulations to be mutually agreed upon by the directors and myself.

"It is my desire to extend the right to participate in the purchase of this stock to those employees still in the service who completed two years or more of continuous service on January 1, 1918, the amount of stock which such employees may purchase to be an amount equal to 2 per cent. of their total wages earned during the entire period of their continuous service before that date.

"The company's records of wages paid to such employees prior to January 1, 1918, indicate that it will require approximately ten thousand shares of common stock to carry out this plan. I wish to donate that stock, but the plan should not end there. It has advantages which are valuable to the company and the present stockholders, and I feel very strongly that the company should make it possible to continue the plan and enable future employees and such of the present employees as cannot participate now, or can participate only partially in the purchase of the above stock, to look forward to the enjoyment of a similar privilege upon a common basis when their loyalty has been shown. This can be done if the company will set aside a portion of its unissued common stock for sale at par to these latter employees, giving to each of them a maximum participation equal to 2 per cent. of wages earned during five years of continuous service.

"Therefore, I make the following offer, viz. :—I will donate sufficient common stock, estimated at ten thousand shares, to enable wage-earning and salaried employees of this company and its allied companies still in the service, who completed two years or more of continuous employment on January 1, 1918, to purchase at par an amount of such stock equal to 2 per cent. of their wages earned while continuously employed prior to that date.

"The above offer is, however, made on condition that this company set aside ten thousand shares of its unissued common stock to be issued for cash at par and made available for sale at par from time to time only to wage-earning and salaried employees of this company and its allied companies, as they attain two years of continuous service, the maximum amount purchasable by any employee to be an amount at par equal to 2 per cent. of the total wages paid such employee during the five years of continuous employment;

with the proviso that an employee entitled to participate on the basis of five years' or more continuous service in the purchase of shares contributed by me shall not be entitled to participate in the purchase of the shares set aside by the company, but an employee entitled to participate to a less extent in the purchase of shares furnished by me may share in the purchase of stock set aside by the company as far as may be necessary to bring his total purchases up to the maximum above stated.

"The stock set aside by the company will enable existing employees who on January 1, 1918, had served continuously two years or more, but not five years, to continue from year to year if they remain with the company their purchase of common shares at par until they have acquired the maximum amount above stated, and will enable existing employees who on January 1, 1918, had not served continuously two years to begin their purchases when they have completed that service, and if they remain with the company to continue such purchases from year to year until they have acquired the maximum amount above stated. It will also for many years to come enable new employees after they have attained two years of continuous service to participate in the purchase from year to year of common stock at par on the same basis and to the same extent.

"If the company, with the consent of the stockholders, shall approve this plan and comply with the above condition the result will be to make available twenty thousand common shares of the par value of 2,000,000 dols. for sale at par to employees of two years' or more standing.

"All of this stock, both that contributed by myself and that set aside by the company, can be distributed to employees most conveniently under the plan above outlined, if represented by certificates of the face value of 10 dols. each, a certificate representing one-tenth of a share of common stock. Such certificates will carry their proportion of dividends paid on the common stock, but the dividends upon certificates may, for convenience, be made payable semi-annually.

"The company should establish a plan to assist employees, whenever necessary, to take up their allotment of certificates and pay therefor in instalments.

"Certificates should be made non-transferable before the date of their maturity, and to avoid having too large a number of certificates mature on the same date they may be issued in two or more series, with different maturity dates for each series, the average maturity period of all certificates being five years from date to issue. As fast as certificates mature they may be exchanged for shares of common stock.

An owner of certificates who leaves the employ of the company for any reason should receive for his unmatured certificates their par value with any unpaid dividends apportionable to them, but in the case of certificates not fully paid for the holder should receive the amount standing to his credit upon his account for the purchase thereof, and in the event of the death or permanent disability of an employee holding unmatured certificates, such certificates should, on full payment being made therefor, be exchanged for stock to be issued to such disabled employee or to the estate of the deceased.

"The interests of the employees in the foregoing respects must be safeguarded by equal representation upon committees formed to deal with all such matters impartially.

"The proceeds of the sale of the shares contributed by me may be used, if necessary, to pay for the shares to be issued by the company for sale to employees; but in that case the money so used must be replaced out of the proceeds of the latter sale, in order that the company's welfare fund may receive ultimately the full par value of the common shares contributed by myself.

"The above is a mere outline of the plan. Many details remain to be worked out and power for this purpose should be given by the stockholders to the board of directors in case the plan is accepted.

"I will hold this offer open until September 1, 1919."

The British Red Cross Society in a list of persons the value of whose services has been brought to the notice of the War Office includes, we note, the name of Mr. Arthur Payne, of Newcastle, divisional superintendent of the 7th Northumberland Auxiliary Hospital.

Assistants' Notes.

Notes by assistants suitable for this column will be considered and paid for on the first of the month following publication.

On Buying Lenses.

More money is wasted in buying lenses than in the purchasing of any other part of the average photographer's equipment. This must not be taken to mean that an expensive lens is not worth its cost; most usually it is, but owing to lack of care and foresight in selecting the type of lens to be bought, much money is frequently wasted by paying for qualities in a lens that can never be utilised.

For instance, take the case of the owner of a 12 by 10 stand camera who wishes to use it for general outdoor work, groups, buildings, landscapes, etc. In selecting a lens he may either choose an anastigmat, working at, say, f/6, or a "rapid" rectilinear, working at f/8. Now, whichever lens he uses he will, in the vast majority of cases, have to stop down to about f/16, and at such a stop there will be no discernible difference in the results given by the two lenses, though the anastigmat will probably cost at least three times as much as the other.

It may, therefore, be interesting and helpful to discuss briefly the most suitable lenses to use for various classes of work.

Let us first take the hand camera, as it is a branch of work that is becoming of increasing importance to every photographer. Now, in this class of work almost every exposure made is verging on the "under" side, and it is therefore a great advantage to have a large aperture lens. But it is very little use the average man using a lens of, say, 8 in. focus, and an aperture of f/4.5, and expecting to get his negatives in sharp focus. Even with a reflex camera the very small depth of focus of such a lens makes it almost imperative to stop down, and when focussing by scale is necessary it is unusable at its full aperture. The depth of focus is decided, of course, by the absolute, not the relative, diameter of the stop, and it may be taken as a rule that for ordinary hand camera work a diameter of 1 in. is the largest that can be successfully employed. Therefore, on a 4½ in. lens one may use f/4.5; on a 6 in., f/6; or on an 8 in. lens, f/8. Even with these apertures very accurate focussing is needed for near objects, and, so far as this use of the lens in concerned, any excess of aperture over those given may be considered a waste of money.

For reflex work I should put the largest aperture worth paying for at 1½ ins., which will give about f/5.6 for the 8 in. lens, the most generally useful focus for half-plate work. The quality of a lens for the hand camera should be of the best, for negatives taken with them will often need to be enlarged, and although the difference in definition of an R.R. and an anastigmat working at f/8 may not be noticeable in a contact print, it becomes immediately apparent on enlarging the negative.

General stand camera work.—As a general rule a small stop may be used for this class of work, and therefore a good R.R. lens is as suitable as any other. But as it is in this class of work that a range of foci is most useful, a word or two must be said about convertible lenses. It is, of course, a great economy to obtain three lenses for the price of one, hence the popularity of the unsymmetrical type of convertible anastigmat. But to my mind by far the best system of varying foci is that found in the Cooke and Aldis lenses, where the focus is changed by substituting a new glass in place of the original front glass. By this means a choice of three foci may be obtained at small extra cost, and with the assurance that each focus is given by a completely corrected non-distorting lens.

Portraiture.—For this class of work the great need is speed, and the lack of depth in a long focus lens is no disadvantage. Therefore the choice usually lies between an anastigmat of f/4.5 or thereabouts, and a portrait lens. The cost of the anastigmat will be considerably greater, but it has the advantage of being the more generally adaptable lens. Simply for portrait work, however, it has no advantages; in fact the rounded field and less critical marginal definition of the portrait combination are preferred by many workers. In these days it is almost unnecessary to add that whatever type of lens is chosen for portrait work, it should be fitted with an adjustment for diffusion of focus.

For copying, the great thing is to obtain a flat field. This can be

got in an anastigmat at a large aperture, but with other lenses it is only a question of stopping down. In fact, any non-distorting lens may be used successfully for copying. It should be noted, however, that a long focus lens is not very convenient for this work, as it necessitates such a great camera extension, especially when one is copying and enlarging at the same time.

I think that this covers most of the average photographer's work, with the exception of wide-angle and telephoto work. To take these in order. There are two main types of wide-angle lenses—R.R.s with the largest aperture about f/16, and anastigmats, which may have an aperture of f/6.3, or larger. In any case, the lens will usually have to be stopped down for exposing, but, especially in the case of dark interiors, the large aperture of the anastigmat is a very great advantage for focussing.

Telephoto lenses may be divided into three classes. First, fixed focus complete instruments, which are nothing more than long-focus lenses with a short back focus; second, variable focus complete lenses, such as the Dallmeyer small Adon; and third, the negative combination to fix behind the usual camera lens. The choice lies between the second and third, and it is entirely a matter of personal taste. But, taken on the whole, the separate negative, used behind a good positive lens, will give the better definition, and allows of a greater range of magnification, as two or three negatives of different foci may be carried. A. G. WILLIS.

Exhibitions.

HAMPSHIRE HOUSE PHOTOGRAPHIC SOCIETY.

NEITHER a war, nor even a peace, can subdue the indefatigable spirits of the Hampshire House Photographic Society, which has again produced a fine exhibition of pictorial work, hung, unfortunately, under bad conditions of lighting, in the hall of Hampshire House, Hog Lane, Hammersmith. For the benefit of those who may be visiting it, let us say that Hog Lane is a narrow and suspicious looking walled passage a few steps beyond a cinema theatre called the Blue Hall in the main road (King Street) which starts at Hammersmith tube terminus. The narrow passage at its further end leads to the doorway of the garden in which Hampshire House stands. The exhibition is open free each weekday from 4 p.m. to 7 p.m. and on Sundays in the morning and afternoon. It is pleasant to meet again on the walls some old friends, in particular the delicate silvery landscape effects of M. L. Misonne, although we cannot help thinking that in adopting a bluish colour of print M. Misonne has sacrificed much of the charm which characterised his prints when done in a neutral tone. One of them, No. 12, receives a medal. Mr. Louis J. Steele makes a considerable show of his striking work, and receives a medal for "After the Bath," shown at last year's Royal. Other medalled exhibits are "The Seine, Paris," by M. R. Demachy, and "The Combat," by W. G. Hill. A special medal presented by Mrs. C. Atkin Swan goes to a fine little piece of portraiture of an airman, "The Night Hawk," by W. Lee. Among much other work which is distinguished by its pictorial quality is that by Mr. Marcus Adams, Mr. Angus Basil, and Mr. Andrew Barclay, the latter a member of the Hampshire Society. No exhibition, apparently, at Hampshire House is regarded as complete without one or two portraits of the president, Mr. George Hawkings, whose cryptic smile is here seen through the camera of Mr. Walter Benington.

A loan collection includes contributions from Messrs. Fred Judge, John H. Gear, Angus Basil, Marcus Adams, Frederick H. Evans, Alex. Keighley, R. Demachy, and F. J. Mortimer, F.R.P.S. The section devoted to colour transparencies and lantern slides is a large one: in order to view it, application should be made to an attendant for the room to be darkened and the transparencies illuminated by electric light. Altogether the Hampshire House Society may be congratulated upon having once more brought together an exhibition which presents to the people of Hammersmith a very representative collection of modern photographic work. It remains open until May 22.

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Applications, April 7 to 12.

REPRODUCTION.—No. 8,735. Photographic reproduction apparatus. A. Cohen.

STEREOSCOPES.—No. 8,800. Stereoscopes. J. M. Hattersley.

FILM DEVELOPING.—No. 8,689. Development and chemical treatment of photographic film. C., F. W., and S. M. Portass.

CINEMATOGRAPHY.—No. 9,113. Cinematograph projectors, cameras, etc. J. Salter.

CINEMATOGRAPHY.—No. 9,251. Cinematograph film-feeding apparatus. W. C. Jeapes.

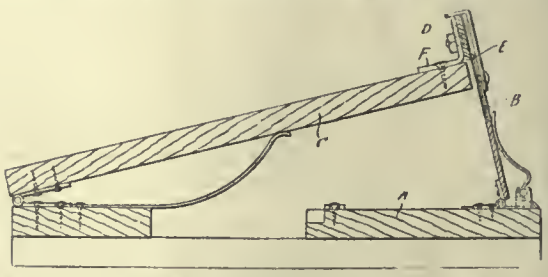
COMPLETE SPECIFICATIONS ACCEPTED.

These specifications are obtainable, price 6d. each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

PRINT TRIMMERS.—No. 123,967 (January 2, 1919). The invention relates to apparatus for cutting or trimming photographs in which the paper is placed on a hinged board, with the edge to be cut projecting between two knives, one of which is fixed to the free end of the hinged board, and the other, provided with an inclined edge, is hinged to the baseboard of the apparatus, and spring-pressed towards the fixed knife.

According to the invention, the fixed knife is secured to the hinged board at right angles to its plane, and with a space between it and the board to allow the edge of the paper to be passed underneath, so as to come between the co-acting blades. By this construction the operator will have an unobstructed view of the paper



placed on the hinged board, and thereby will be able to determine with precision the width of the margin to be left around the picture. Obviously, also, as the shearing blades are arranged practically parallel to each other instead of being at right angles to each other as heretofore, the knives will retain their sharpened edges for a longer period.

In the drawing, which is a side elevation of the trimming apparatus, A represents the baseboard and B the inclined knife hinged thereto; C is the hinged board and D the fixed knife, secured, as shown, approximately at right angles to the board C, and mounted thereon by means of brackets, F, at each end of the board, so as to provide a space, E, between knife and board through which to pass the paper or other material to be cut or trimmed.

The fixed knife, D, may be made of a flat equally thick piece of steel, as shown, or it may be strengthened against the pressure of the spring-pressed knife by making it of angular, pyramidal, wedge, or other suitable shape in cross-section. John Merrett, Trowbridge, Wilts, and Frank Garrett, 15, Dorset Street, Salisbury Square, Fleet Street, London, E.C.4.

CONTINUOUS MOVEMENT CINEMATOGRAPH.—No. 112,488 (January 2, 1917). The image is kept centrally on the screen or plate by means of a prism of annular form, mounted on a drum which is rotated to make one complete revolution during the movement of one picture, the film-moving and prism-rotating mechanism being geared accordingly.

The rotating mechanism is a countershaft E, driven by a suit-

able gear connection *e*, from the film-driving mechanism. On the outer end of the shaft E is mounted a drum F, having a wide periphery *f*, on which is mounted what may be termed a continuous prism G. The prism G is formed with a single piece of glass conveniently and preferably, and is such that the central point of any cross-section lies on a circle, and the edge of smallest diameter is slightly spiral, as indicated in Fig. 2, as well as in

Fig. 1.

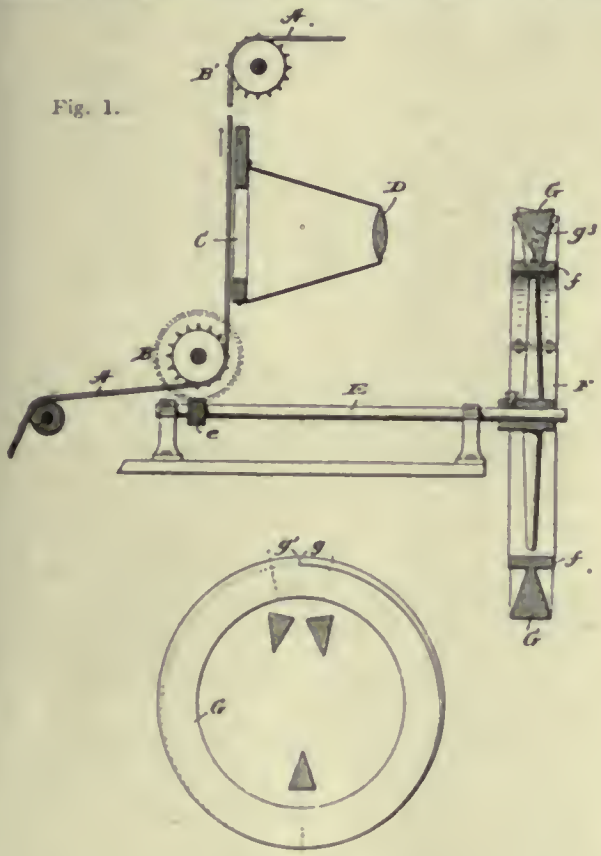


Fig. 2.

Fig. 1 in section. The spiral or volute produces upon the movement of the prism, variable angular dispositions of the operative parts of the prism with reference to planes passing through the axis of the projector.

In the form of the prism, the starting point is shown at *g* while the finish point is indicated at *g*¹. The centres of the sections of the prism at these points are the same, as shown at *g*², so that the refraction of the light-rays is substantially continuous without intermediate jumps or interruptions, the light-rays being gradually passed from one end to the other as the points *g*, *g*¹ pass the lens. The relative angularity of the different parts of the prism is such as to maintain the proper refraction throughout the upward movement of the picture.

In general operation the prism is placed in front of the lens D so that the rays of light passing through the picture and lens D pass through the prism and are properly straightened progressively from the entry to the exit of the picture in its passage by the window C, as the prism is turned in consonance with the movement of the picture. The prism travels in consonance with the picture strip, and as the film bearing the picture reaches the opening the prism receives the light-rays passing therethrough, and the angular portion of that part of the prism which receives these rays is such that the rays are projected upon the screen. The continued movement of the prism and the picture causes different portions of the prism to be presented to the light-rays, whereby these rays are centered upon the screen irrespective of the position of the picture during its passage by the window. In this way it will be seen that when a picture enters the window the prism is at the starting point G and makes one complete revolution while the picture is passing by the window, so that when a succeeding picture reaches the window the angle of the prism at that time is such that the light-rays are centered upon the screen. William Henry Selby and Frederick Arthur Selby, Kansas City, Missouri, United States.

Analecta.

Extracts from our weekly and monthly contemporaries.

Spring-time Photography.

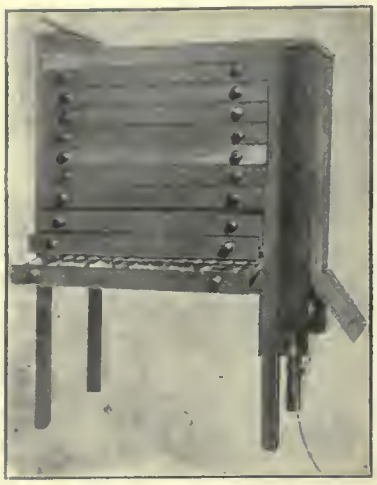
To preserve the characteristic tonality of grey tree-trunks and the net-work of branches (writes W. S. Davis in "Photo-Era"), a rather short scale of middle-tones must predominate in a picture; consequently, a full exposure should be given whether or not it is deemed essential to employ a ray filter. In many cases, a delicate diffusion of focus seems to help to suggest the soft, vaporous quality of atmosphere so often seen on quiet spring days. There are several ways to obtain this—either in the negative or during printing—without resorting to the use of special soft-focus lenses, although these are quite suitable if at hand. A simple method to obtain general softness in the negative with any ordinary lens is to stop down considerably, and then to rack out the lens beyond the point of sharpest focus until the desired degree of diffusion is seen on the focussing-screen—the size of the stop determines the proportionate amount of diffusion in the various planes of the subject. When printing by contact, one or two sheets of celluloid interposed between negative and paper may be tried. An enlargement, especially upon rough paper, can be given pleasing softness of definition by putting the lens of the enlarger very slightly out of sharp focus. The main point to bear in mind, in all cases, is to suit the mode of treatment to the theme to be expressed. Neither soft-focus nor a sharp image is artistic in itself, although either may be an aid to that end, according to the effect required or the thought to be expressed.

New Apparatus, &c.

The X.L. Drying Cabinet. Made by Messrs. Brodrick, 50, High Street, Charing Cross Road, London, W.C.2.

As we have many times said, the drying of negatives is one of the photographer's operations which has continued to be done without anything like an adequate regard to the exclusion of dust from so delicate a surface as one of wet gelatine or even, for the most part, in the aim to accelerate the drying of the plates. And as regards prints, it is only within the last few years that means have been at all generally adopted for safeguarding prints during the drying process and equally for expediting this latter. Photographers have many of them rigged up cupboards or other receptacles in which prints could be dried in a current of warmed air, but so far as the apparatus manufacturer is concerned the only evidence of his interest in what is a most universal problem has been the introduction of the models of rotary print-dryer, all we believe of American origin. Therefore it was with a good deal of interest that we inspected last week a piece of apparatus which has just been placed upon the market by Messrs. Brodrick for the expeditious drying by artificial heat of both negatives and prints. The apparatus consists of a series of shallow drawers, something in the manner of the sectional type of washer which was introduced some years ago, the bottom of each drawer being formed by crossing tapes. Ten of these drawers, providing a surface of 40 square feet, are mounted in a wooden cabinet so that any one of them can be at once withdrawn, the face of the drawer (on which the handles are mounted) butting against the bar which supports it in the cabinet and also "contacting" edgewise with the fronts of the drawers above and below. The whole front of the cabinet is thus sealed almost as though it was provided with a solid door. On each side the framework of the cabinet is left open, on the right to receive along the surface of each drawer the current of warm air and on the left to discharge this current into a vertical shaft. The air in the model we saw is warmed by a bar gas-burner, although an electrical heater can be had in place of it at the same price. The burner is placed at the foot of a wrought-iron shallow chamber which encloses the right-hand side of the cabinet. Air is thus drawn in and passes with the products of combustion of the gas

over and through the series of drawers on the tapes of which prints or negatives are laid. The burner is, of course, one of the Bunsen type, its blue flame denoting the complete combustion of the gas, and there is no reason to suspect any action upon the prints of the products of combustion. On this point Mr. Brodrick informed us that some delicate tests had been made in a drying apparatus of this same type, but made for the drying of fruit, and no taint from burnt gas could be discovered. When it is remembered that in the ordinary gas oven food



is cooked in an atmosphere which is considerably richer in burnt gases than is that of this apparatus, the idea that prints can suffer anything by a short exposure can be dismissed. The burner consumes comparatively little gas, and we were informed that when the apparatus is kept going all day the cost of gas at 3s. 6d. per 1,000 is only 9d. The apparatus occupies a floor space of about 3 ft. 6 ins. by 20 ins. and is 5 ft. in height. It is nicely made in oak, and in appearance might be mistaken for a cabinet such as many a photographer puts in his studio for the storage of large prints. As regards its speed of drying, we witnessed a test in which some prints wet from the wash water were dried in about fifteen minutes. When, as is usual, prints are first blotted the whole contents of the cabinet, about 230 half-plates, should dry in from twelve to fifteen minutes. The apparatus is one which is evidently the result of most careful design, and we should say that there will be a large demand for it among makers of photographic prints. The price is £16 16s.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

SATURDAY, APRIL 26.

Huddersfield Naturalist and Photographic Society.—Lantern Lecture. "Results of Experiments for the Spraying of Potatoes in a Polluted Atmosphere." Mrs. A. S. Bacon, B.Sc.

MONDAY, APRIL 28.

City of London and Cripplegate Photographic Society.—"Practical Intensification and Reduction." N. F. Horne.

South London Photographic Society.—"Impressionists and Past Impressionists." J. Vacy Lyle.

TUESDAY, APRIL 29.

Royal Photographic Society.—"Some English Cathedrals: Ely, Lichfield, Gloucester, and Wells." W. J. Roffey.

Leith Amateur Photographic Association.—"Exposure of Negatives." C. S. M'Cabe.

Hackney Photographic Society.—Print Competition.

Manchester Amateur Photographic Society.—Sale by Auction.

WEDNESDAY, APRIL 30.

Croydon Camera Club.—Demonstration: "Kerotype." F. W. Kent and T. P. Middleton.

Tunbridge Wells Amateur Photographic Association.—Annual Exhibition.

THURSDAY, MAY 1.

Hammersmith (Hampshire House) Photographic Society.—"More Talk on Lenses and What They Do." W. H. A. Fincham.

ROYAL PHOTOGRAPHIC SOCIETY.

MEETING held Tuesday, April 15, W. B. Ferguson, K.C., in the chair.

Mr. F. F. Renwick read a paper entitled "Colour Values in Monochrome and a Viewing Filter as an Aid to Obtaining Them." After a preliminary exposition of recent researches on visual sensitiveness to colours, in the course of which he gave a résumé of the most recent experimental data obtained in this field, the lecturer proceeded to deal with the question of the translation of colours into monochrome by means of a colour-sensitive plate and, as was invariably necessary, a light-filter. He laid emphasis upon the two distinct uses to which panchromatic plates, in conjunction with light-filters, were put. In the case of making the selective negatives required in the various processes of colour photography the panchromatic plate was, of course, not employed for a translation into monochrome of the colours of the original but only for recording a certain selection of them. In the case, however, of making a single negative of a coloured subject the aim was to obtain in the negative, or rather in the positive from it, tones which corresponded with the visual perceptions of the colours themselves. If a panchromatic plate and filter were so adjusted that they rendered correctly, say, the visual perception of the spectrum of arc light, the combination would also render correctly that of other continuous spectra—differently, because they were different to the eye. By means of curves in which wave-lengths were plotted against the logarithms of colour luminosities, Mr. Renwick had very ingeniously developed a method of arriving at the absorption properties of filters which were required in order to show visually the effect of using a given filter upon a given panchromatic plate, or, conversely, the properties of a filter, necessary with a given panchromatic plate, for producing a result observed visually through a given filter. He set forth the many difficulties of absorption and permanence of dyes which stood in the way of realising in practice the properties thus theoretically worked out, but he was able to show a series of experimental filters which to a very satisfactory degree corresponded with the theoretical requirements. By means of a colour test-chart projected on the screen the action of these filters was shown, and every user of orthochromatic plates could not fail to be immensely interested in the series of viewing filters which, when used by the eye, for example, in the form of goggles, would show the result of using such-and-such a light-filter with a given colour-sensitive plate, the light-filter itself being used in combination with the glasses. Mr. Renwick further showed the photographic transparencies corresponding with these visual observations of the coloured original, and it was clear that from his experiments the orthochromatic worker should secure a degree of precision in his results which hitherto has been absent. Unfortunately, Mr. Renwick could not hold out any immediate hope that the light-filters would be commercially obtainable.

On the proposition of the chairman the very hearty thanks of the meeting were accorded to the lecturer.

PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

A MEETING of the Council was held on Friday, April 11, 1919. Present: Messrs. Basil, Brown, Chapman, Chaplin, Chase, Chidley, Corbett, Ellis, Fry, Haines, Hana, Illingworth, Lang-Sims, Lankester, Read, St. George, Speaight, Spink, Wakefield, and Watson.

The minutes of the previous Council meeting were read and confirmed. Being the first meeting of the newly elected Council, the Hon. Secretary read the standing orders, and these were confirmed without alteration.

Mr. Lang-Sims informed the meeting that one of their members, Mr. C. F. Dickinson, had recently lost his wife after a lengthy and distressing illness. He moved, and it was seconded and carried:—"That the Council expresses its deep regret at the loss which Mr. Dickinson has sustained in the death of his wife, and offers its sincere sympathy with him in his bereavement."

It was moved by Mr. Frank Brown (Leicester) and seconded by Mr. Reg. Haines (London) that Mr. S. H. Fry be elected hon. treasurer for the ensuing year. The motion having been carried, Mr. Fry stated his willingness to carry on for another twelve months, and thanked the Council for the continuation of the compliment of election to the office.

After a general and somewhat lengthy discussion in connection with the duties of the hon. secretary, it was proposed by Mr. Speaight (London), seconded by Mr. Illingworth (Northampton):—"That Mr. S. H. Fry be appointed to the office of hon. secretary." The motion having been carried, Mr. Fry said he would do his best to carry out this extra duty on the understanding that the Council would relieve him of both his offices at the end of twelve months. He added there would be a lot of work to do, but he would do the best he could.

It was moved by Mr. Gordon Chase (London) and seconded by

Mr. A. Basil (London) and carried:—"That the 'Circular' be continued for the ensuing twelve months, and that the treasurer be authorised to expend £120 thereon."

The Council decided, on the proposition of Messrs. Reg. Haines (London) and A. Basil (London), that the raised subscription should apply to all, including those members who had paid (at the old rate) in advance.

Resolved that Messrs. Alfred Ellis and R. N. Speaight be authorised to sign cheques for and on behalf of the association, and that a copy of the resolution be forwarded to the association's bankers for their information.

A confidential communication from a member in the matter of Whitley Councils was discussed, and the hon. secretary was instructed to make some necessary inquiries. It was stated that no trade (industry) was able to form a Whitley Council unless both sides, i.e., employers and employed, had a trade union or an association. It was proposed by Mr. Brown (Leicester), seconded, and resolved:—"That the hon. secretary obtain from the Ministry of Labour all the information he can on the subject and report to the Council."

The Hon. Secretary reported the receipt of a letter from the secretary of the University Advisory Committee (Y.M.C.A.), Aldershot, asking if the committee could be informed of the necessary training required, and the advantages offered, by professional photography to persons desirous of taking up photography as a means of livelihood. It was agreed to refer the matter to Mr. Marcus Adams, to whom the inquiry was originally made.

CROYDON CAMERA CLUB.

Mr. A. E. Farrants demonstrated the beauties of Wanstead Park by means of excellent lantern slides, which set up an almost record rate of oscillation of the lantern-carrier. After the usual graceful allusion to the peaceful reputation of the club, he said he had nothing contentious to offer beyond the statement that Wanstead Park knocked into fits anything in the neighbourhood of Croydon. Few in the club appeared to know where Wanstead held out (such is fame!), but a map showed it to be close to Epping Forest, of which it once formed part. A remark of the lecturer that there was practically nothing between it and the North Pole doubtless accounted for the many winter scenes shown. The famous Wanstead House, dating from early history, has altogether disappeared, a female descendant of the Tilneys being the last holder. She married, but her husband squandered the estate and expired of drink and the usual etceterns, whilst she died of a broken heart. Most pathetic, but, the evening being again "dry," forbade a single tear.

In the discussion Mr. Harpur chided the lecturer for employing some cushion-corner masks, strongly disliked by one who, curiously, has been built on cushion-corner lines. Mr. Reynolds expressed a conviction that Mr. Farrants was an artist, poet, and naturalist in one, an opinion, apparently, based on the slides and not on the lecturer's personal appearance. The president, Mr. Keane, among other complimentary remarks, alluded to the beautiful stuff shown as being at the very backdoor of Croydon.—A most cordial vote of thanks was accorded for a very pleasant evening.

Commercial & Legal Intelligence.

At the London Bankruptcy Court on Tuesday, April 15, before Mr. Registrar Mellor, the public examination was appointed to be held of Phillip Ernest Le Poer Power, described in the Receiving Order as F. D. Raymond, late of 7, Queen Square, Bloomsbury, W.C., but upon the case being called on for hearing Mr. J. B. Knight, who attended as Official Receiver, asked that the examination might be adjourned. He explained that the debtor had been bankrupt on three previous occasions, the first in 1893, at Newport, Isle of Wight, when his liabilities amounted to £144,213, and the assets were estimated to produce £9,282, but only realised £1,847. The other two failures were in the High Court of Justice, the first being in 1899, when his liabilities amounted to £34,599. The next occasion was on December 8, 1909, when his liabilities amounted to £25,000. The public examination in both the last-mentioned bankruptcies had been reinstated, and were to take place on June 3 next. Since his previous failure, the debtor had been interested in a number of companies. In September, 1917, he formed a private company called Colourgraphs, Limited, with a capital of £36,000 in 30,000 preference shares, and 6,000 ordinary shares of £1 each, with the object of acquiring from a Mr. Barron his processes and patents for enlargements in colours from ordinary photographs. Those processes and patents were acquired for £27,000 preference shares and all the ordinary shares. By an agreement with Barron he received from him 9,000 preference shares and 2,000 ordinary shares, and he was to find working capital up to £1,000. As a matter of fact he had probably put into the company about £4,000, which he raised by charging his shares. In November, 1918, he registered another private company called Photocol, Limited, with a nominal capital of £115,000, of which £100,000 was in 10 per cent. preference shares, and £15,000 in ordinary shares. For the purpose of that registration he borrowed £1,000 from a Mr. Soward, which was still owing. The object of the company was to acquire from Barron his patents for the washing and manufacture of photograph plates by a new rotary process. All the shares were to go to Barron with the exception of £16,000 preference shares, which were for the working capital. It was intended to offer to the shareholders of Colourgraphs, Limited, one share in Photocol, Limited, for each share in Colourgraphs, Limited. A provisional contract had been entered into for the purchase by the company of fully equipped works at Thornton Heath, and he hoped to receive from Barron certain ordinary shares for his services. Eventually the examination was adjourned until June 27.

News and Notes.

Lancashire Society of Master Photographers.—At a committee meeting of the above society held in Manchester on Tuesday, April 15, 1919, it was resolved:—"That this meeting of Lancashire Master Photographers desires to place on record its appreciation of the ready manner in which the plate-makers have dealt with the recent revision of prices, and respectfully to suggest that in all further arrangements the prices of plates and papers be so arranged as to allow to the bona-fide professional at least 50 per cent. off list prices."

Lectures on Technical Optics.—The summer term at the Imperial College of Science and Technology opened on the 29th inst., when the course of lectures on optical designing, computing and testing room methods was continued by Professor A. E. Conrady, A.R.C.S. A special course dealing with the theory and use of both terrestrial and astronomical telescopes will also be given by Professor Conrady, commencing May 1. Polarised light and polarisation apparatus are to be fully dealt with—no previous knowledge of the subject being assumed—by Professor Cheshire, C.B.E., A.R.C.S., whose lectures commence on May 2. Mr. L. C. Martin, D.I.C., A.R.C.S., B.Sc., will deliver a course of lectures on colour, commencing May 7. All the fees are nominal.

Imports of Photographs.—In the House of Commons on April 14, Sir C. Kinloch-Cooke asked the President of the Board of Trade if he is aware that the restriction of the import of photographs into this country from certain other countries has now been extended to all parts of the world except under special licence; that this is causing some dissatisfaction in art and literary circles, and if he can see his way somewhat to modify the restriction? Mr. Bridgeman: The extension of the prohibition refers to the action taken on March 1, when, as was announced some weeks before, a number of general licences were withdrawn in accordance with general policy, and in this case, as in others, the arrangement existing before the issue of the general licence was reverted to. These restrictions will now be reconsidered in common with other import restrictions in the manner which has already been announced.

New Retail Businesses.—Complaints are being made (says the "Times") that people who apply for licences to open shops or to take over existing shops from their present tenants have to wait at least three weeks to get the necessary permission. Inquiries show that delay in granting application is not unusual—the period of waiting being sometimes as long as two or three weeks—but this is said to be necessary to avoid hasty decisions which might adversely affect

serving or recently discharged soldiers and sailors. Out of 43,000 applications for licences which have so far been made 32,000 have been granted, 3,000 have been refused, and the rest are under consideration. Fresh applications are being received to the number of about 2,500 a week.

The administration of the Retail Business (Licensing) Order has recently passed from the Ministry of National Service to the Ministry of Labour. The Order was made during the war to protect the businesses of men called to the colours from competition arising out of the unusual trade circumstances created by the war. It is with that end in view that the regulations have been and still are administered. An official of the Ministry of Labour has explained to a representative of the "Times" that the administration had been decentralised and divided among nine divisions throughout the country. Over 2,000 permissive Orders are issued every week. All applications before refusal are submitted either to a divisional council of the Ministry of Labour, or, in London, to the local advisory committees associated with the employment exchanges. Both the councils and the committees are composed of business men.

When an application is made in London, often by letter, the person desiring to open a shop is sent a form on which certain essential particulars have to be furnished. When the form is returned it is handed to a special investigator for the area. His duty is to visit the premises which the applicant wishes to open, and also businesses of a similar character within a radius of about half a mile to ascertain either whether the owners are absent on military or naval service, or whether the businesses are handicapped by the absence of a serving member of the family. He then reports to the official in charge of the district. The official in turn submits a report to the local advisory committee, a body free from departmental membership which considers the case and recommends the granting or refusal of the application. On their recommendation action is taken.

When a soldier or sailor is demobilised and opens or reopens a business he is given protection for a month or so in order that he may establish himself. Any question of trade competition is completely excluded from the considerations which govern the granting of licences. The Order may not be popular with everybody, but nearly a hundred resolutions have been passed by public bodies pressing for its retention.

Industrial Radiography.—An important series of papers on the examination of materials by X-rays will be read at a joint meeting of the Röntgen and Faraday Societies, Tuesday next, April 29, 1919, in the rooms of the Royal Society, Burlington House, London, W.1, from 5 to 7 and from 8.30 to 10 p.m. The chair will be taken by Sir Robert Hadfield, Bart., F.R.S., President of the Faraday Society, who will introduce the discussion.

Professor W. H. Bragg, C.B.E., F.R.S., will deliver an address on "Radiometallography."

Professor Alfred W. Porter, F.R.S., will give short abstracts of the following papers, translations of which will be presented by Sir Robert Hadfield:—

(a) Investigation of metals by means of X-rays. By F. Janus (Munich) and M. Reppchen (Cologne).

(b) The principles governing the penetration of metals by X-rays. By Dr. G. Respondek (Helensee).

Monsieur H. Pilon and Mr. Geoffrey Pearce will give a brief description of the "Apparatus used for Radiometallography," illustrated by lantern slides.

Captain R. Knox and Major G. W. C. Kaye will present a paper on "The Examination of Timber by X-rays."

Sir Robert Hadfield, Bart., F.R.S., Mr. S. A. Main, B.Sc., and Mr. J. Brooksbank, B.Sc., A.R.C.S, will read papers on:—

(a) "Testing the Absorption Power of Different Steels Under the X-rays."

(b) "X-ray Examination as Applied to the Metallurgy of Steel."

(c) "Radiographic Examination of Carbon Electrodes used in Electric Steel-making Furnaces."

(d) "A Method of Testing an X-ray Tube for Definition."

Lt.-Colonel C. F. Jenkin will contribute a note on "The Detection of Hair Cracks in Steel by means of X-rays."

Mr. F. F. Renwick will read a paper on "The Behaviour of Photographic Plates to X-rays Considered in Relation to the Radiography of Metals."

Dr. R. E. Slade will read a paper on "Contrasts in X-ray Photographs."

Monsieur E. Schneider (Le Creusot), President of the Iron and Steel Institute, will present a paper on "Radiometallography."

Professor A. W. Hull, Mr. C. T. Heycock, F.R.S., Mr. A. A. Campbell Swinton, F.R.S., Mr. F. W. Willcox, Captain Leslie Aitchison, Mr. Donnithorne, and others will contribute to the discussion.

Major C. E. S. Phillips will exhibit apparatus used at the War Office X-ray laboratory for testing definition of X-ray bulbs.

Exhibits and demonstrations will also be given by Monsieur Pilon, Messrs. Newton and Wright, Watson and Sons, Cox and Co., and The British Thomson-Houston Co., Ltd.

Correspondence.

**** Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

**** We do not undertake responsibility for the opinions expressed by our correspondents.*

SUBSTITUTE FOR ACETIC ACID IN THE WET-PLATE DEVELOPER.

To the Editors.

Gentlemen,—I have just received my copy of the Almanac, and I find on page 271 formula for a substitute for acetic acid in the wet-collodion process.

Over 35 years ago I was using for the same purpose the following formula, which I copy from my old notes and send you, as it may prove interesting to your readers. I called it nitro-gelatine developer, and I used no other on wet plates for many years; in fact, I have never changed it.

Stock Solution Nitro-Gelatine.

Gelatine	5 drs.
Water	1 oz.
Nitric acid	1 oz.

Developer (Winter).

Double sulphate iron and ammonia	4 drs.
Nitro-gelatine solution	1 dr.
Alcohol	1 dr.
Water	6 ozs.

Developer (Summer).

Double sulphate iron and ammonia	3 drs.
Nitro-gelatine solution	1 dr.
Alcohol	1 dr.
Water	4 ozs.

Thanking you for the many items of information I have secured from your publication.—I am, yours very truly,

Chas. Leroy.

1146½, Broad Street, Newark, New Jersey, U.S.A.

THE FIXATION OF BROMIDE PRINTS.

To the Editors.

Gentlemen,—Your article, I am glad to see, "rubs in" the all-important fact that perfect fixation is the thing to strive for.

Obviously, if the silver salts unacted on by light are not rendered completely soluble in the washing water by the efficient action of the fixing-bath, no amount of washing will compensate for the neglect of such a vital point.

As to the question of plain hypo versus acid-hypo, it is rather a counsel of perfection to say that a plain hypo bath is best, but, as we know, its rapid discoloration is against it for professional use.

The objection that an acid-hypo bath will remain clear even after its fixing properties are seriously diminished is a well-founded one.

Personally I consider the amount of metabisulphite usually recommended for addition to the hypo is excessive, in that it tends to prolong the clear state of the bath up to the time when the power of the fixing agent (hypo) is considerably weakened. Some years ago I made a few experiments to find how much metabisulphite was required to keep the bath clear for only as long as it was active in its fixing properties. Varying amounts of metabisulphite were tried

and the fixing powers of the bath tested with unexposed plates in the usual way, with the result that I have for a long time used about one-quarter of the metabisulphite usually prescribed.

To take an example: One well-known maker of bromide paper gives a formula—hypo, 18 ozs.; water, 180 ozs.; metabisulphite, 4½ ozs. I cut this down to 1 oz., and as soon as the bath discolours it is discarded, with the full knowledge that its fixing powers, although still efficient, are approaching the danger line. Similar experiments can easily be made by anyone, and proportions decided to suit individual requirements.

To my mind this furnishes a surer test of the number of prints that a bath may be used for than the plan suggested by Mr. Stine, whose contribution to the "Photo Era" has been so ably dealt with by yourselves.—Yours faithfully,

Pontypridd. ALBERT O. FORREST.

THE ASSISTANT QUESTION.

To the Editors.

Gentlemen,—The future of photography, the relation of employers to assistants and the training of the latter are questions that are intimately related to each other. No doubt economic forces not altogether under our control will be the predominant factors in determining future developments, but unless we are to sit down with folded hands and say, "Kismet," we may as well bring what intelligence we have to bear on these questions. So far as portrait and general work is concerned it may, I think, be conceded that an all-round experience such as would be got in a personally-conducted business employing from three or four up to a dozen persons in a good middle-class neighbourhood, affords the best opportunity at starting for securing that general practice in varying kinds of work which every youthful photographer should, if possible, obtain before specialising.

There are, however, not enough of these berths to go round, and in any case there is the fact that a considerable number of youths drift into the photographic business with only a partial training. One has only to look through the trade advertisements of the "B.J." since demobilisation got in full swing to see what a considerable amount of work is being catered for by trade workers in the way of printing and enlarging, and to realise what a restricted experience the younger workers engaged in postcard and similar machine printing are likely to get. Also, it will be noticed that in London technical work is being organised on limited company lines, where formerly it was undertaken by individual workers on their own account or in partnership with another operator. There is therefore a need that technical workers, printers and enlargers should organise themselves almost more than for portrait operators. Doubtless in a year or two, as Mr. Fisher's Act comes into operation, some of the younger workers will have to attend classes in the day-time, but meanwhile a good number will have passed the age limit at which attendance is compulsory. On the portrait side, what I should like to see, and what, if the war had not broken out, I was hoping might be discussed informally at a conference of the P.P.A., is the practicability of a number of P.P.'s engaged in somewhat similar work but with businesses of different sizes getting sufficiently in touch with each other to be able to pass on their junior assistants from the smaller to the larger concerns, where more experience could be gained, instead of all engagements being left to advertising.

The Edinburgh P.P.'s are to be congratulated on having started their retouching class, and those in other large towns ought to follow the example. The teaching, however, should be confined to those definitely engaged in a photographic business, otherwise we may easily get a much larger supply of retouchers than we need. Retouchers do not wear out in twelve months, like a suit of clothes.

I hope we shall hear more of Mr. Adams's scheme for instruction by postal lessons.—Yours, etc.,

LOOK FORWARD.

FORTHCOMING EXHIBITIONS.

April 17 to May 22.—Hammersmith Hampshire House Photographic Society Annual Exhibition. Two open classes. Joint secretaries, J. G. Abrahams, 41, Hamilton Terrace, London, N.W.8: A. H. Page, 12, Lane Grove, London, W.12.

Answers to Correspondents.

SPECIAL NOTICE.

In consequence of general reduced supplies of paper, as the result of prohibition of the importation of much wood pulp and grass, a smaller space will be available until further notice for replies to correspondents.

Moreover, we will answer by post if stamped and addressed envelope is enclosed for reply: 5-cent. International Coupon, from readers abroad.

The full questions and answers will be printed only in the case of inquiries of general interest.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

T. B.—There is no doubt that the stains are due to particles of rust on the paper. The best remedy is to filter the tap water through a bag of flannel, which probably is more easily attached than one of the filters sold for ordinary water taps.

H. J. C.—There is no reason why the developer made up according to your formula with pure chemicals should go black. We can only suggest that some of your chemicals are of bad quality, or there has been contamination from the dishes or bottles.

E. J.—We think you should be able to do fairly good work in the lean-to you describe. It is rather short for full-lengths, but for heads and half-lengths it is quite practicable. It will be desirable to have white curtains to cover all the glass when the sun is on. You will hardly require dark blinds, as you have not a great area of glass. The specimen you enclose is rather flat. Perhaps you overdo the reflection.

E. V. M.—The lens appears to be a rapid rectilinear. The apertures as marked cannot be *f*/values, as the fullest possible aperture is only about *f*/8. It is rather difficult to unscrew cells once they are tightly fixed. An optician would turn up a boxwood chuck and tap the lens into it. We have found the best way is to fit the cell into a Thornton-Pickard shutter with the rubber moulding very tight. This will generally give enough purchase to turn it.

L. L.—Box-top negatives are purchased by firms who specialise in these for people making the chocolate boxes for the well-known firms. They are Messrs. Lilywhite, Ltd., Dunkirk Mills, Halifax; the Rotary Photographic Company, West Drayton, Middlesex; and Philip G. Hunt, 332, Balham High Road, London, S.W. Usually the negatives are bought in sets of six, and an average price is a guinea per negative, although more is sometimes paid for exceptional subjects.

T. F. C.—(1) We should say that exposures of rapid bromide paper from average negatives would not be more than a second or so with the 100 c.p. lamp: approximately double this time with the 50 c.p. lamp. The arrangement seems to us excellent. It is, in fact, that commonly adopted for box printing machines working from an incandescent mantle. (2) There are no books worth mentioning on professional photography, but we have a little manual, "The Portrait Studio," from which no doubt you could gain some help, issued by our own publishers, price 10d. post free. (3) Half-plate negatives are altogether too small for glazing the studio. You would be pretty certain to have a lot of trouble from leakage in bad weather, and our own opinion is that it would be false economy to avoid the cost of glass of the ordinary larger size.

O. E.—1. There have been no formulæ published so far as we know of Monomet-hydroquinone for tank development. Certainly no time and temperature tables for this developer are available. Very likely you could obtain these data from the White Band Manufacturing Company, Progress Works, South Croydon, but, failing that, it should not be difficult to adapt the ordinary Monomet-hydroquinone formula to tank development, say, by

adding some more sulphite and by finding the degree of dilution which will give you a sufficiently strong negative in from fifteen to twenty minutes. 2. We do not know a twin-lens N. and G. reflex, and we rather gather from the other data that you give that you refer to the ordinary single-lens reflex. If this is so, a fair price to a direct purchaser would be about £25. A dealer would give you only about £15.

F. A.—No assignment of copyright or licence to issue copies of a copyright work such as that of the "Wreck" is valid in law unless it is in writing signed by the owner of the original in respect of which the assignment or licence is made. The permission which you have received has been of a very irregular kind, and we think it would be difficult for you to prove through your witnesses that you had made to you definitely a partial assignment of the copyright, for example, to issue postcards. The letter merely asks you not to print any more cards. Evidently there can be no objection to your disposing of those which you have left, and we cannot see that you will be harmed by making the acknowledgment of the authorship of the enlargement. In these copyright matters to be forewarned is to be forearmed, and we would direct your attention to the little manual, 'Photographic Copyright," issued by our publishers.

H. H. T.—Even with your 29-ft. run the longest focus lens you can use for full-length C.D.V.'s is 8½-in. focus, which is too short for the best result from half-length cabinets, and still more from cabinet heads. We advise you to give up trying to do all the classes of work with the one lens, and to choose a focal length which will enable you to take half-length C.D.V.'s within your 29 ft. and at the same time is long enough to give you satisfactory results in portraits taken at closer quarters. For this, the focal length need not be more than 13 ins., and generally speaking you would not find any ill effects from working with the Dallmeyer 3 B of 11 ins. focus. We advise the choice of either this lens or the Ross Portrait No. 3 of 12 ins. focus, or one of the Cooke portrait lenses of about 12 ins. focus. Either of these is preferable for pure portraiture to an anastigmat, although, of course, the latter has its use in making large groups of whole-plate, or even, at a pinch, 12 x 10.

H. F.—1. Without seeing the print we should say that the only means of making a satisfactory copy by the use of filters is by using a red filter such as the Wratten 29F, with a panchromatic plate. But as we imagine it would not pay you to get a filter for this special purpose you might perhaps put out the making of a copy negative to a firm such as Mr. Stewart Bale, 53, Lord Street, Liverpool, a specialist in orthochromatic work. Otherwise you might try what benefit you could get by photographing with the deepest yellow filter you have and a panchromatic plate, though we should doubt if the advantage would be very great. In most cases such as this the most practical method is to make the best negative you can by ordinary means, from that an enlargement, work up the latter, and from that make a new copy negative. 2. If the work is of good quality we should say at present time from £1 to 30s. for each negative and one print supplied therefrom.

P. L.—(1) With the Dallmeyer and Cooke lenses you can obtain absolutely sharp portraits, but also, by adjusting the lens, you can obtain a certain moderate degree of diffusion. Many professional photographers think this diffusion is quite enough, but, on the other hand, many amateurs go in for much more diffusion than these lenses will give, and for them there are the "Verito" and the "Portland." The former is made by the Wollensak Optical Company, and sold in this country by Messrs. W. Butcher and Sons, Camera House, Farringdon Avenue, E.C.4. The latter is sold by Messrs. Sinclair, 54, Haymarket, S.W. (2) There is no exact focal length for a plate of a given size. It is a question of choosing the lens of longest focal length which you can use in a given space or which can be fixed to the camera. A 10-in. lens (25.5 cm.) of the portrait type would not cover your 24 x 18 cm. plate well enough, although an anastigmat would. We think your best course would be to state the exact size of the lens panel of your camera to the maker of the lens which you think of having, and thus to find out if the camera will carry it.

K. T. Ida.—(1) It is certainly true that plates of moderate speed such as H. and D. 250 are used when circumstances so require for very rapid focal-plane exposures at an aperture of say, *f*/6.3, and that a good deal can be done by humouring the plate in development, especially by using the developer warmed to a temperature of about 70 to 75 deg. F. But we think *f*/16 is altogether too small a stop for such rapid exposures except in very brilliant light and with open subjects such as seascapes or sailing boats. Probably Dr. Abrahams had these in mind. Generally speaking, the practice among users of focal-plane cameras is to employ the fastest plates obtainable and to develop in the ordinary way. (2) The gamma infinity of a plate is a property which permits of more satisfactory results being obtained at very short exposures than those from a plate exposed under the same conditions, which has merely a much higher speed number. Thus, for the purpose of very brief exposures this property of the plate is a very important one, although the matter is largely ignored by users of focal-plane cameras. The only book by Dr. Mees is "Investigations on the Photographic Processes," published by Messrs. Longmans, price 6s. 6d., which you could obtain from a Japan firm.

R. G.—(1) The 2,000 c.p. is much too small a light for short exposures, and, indeed, for the best kind of lighting. We advise you to get a copy of the "B.J." of October 26, 1917, price 4½d., from our publishers, and have your electricians instal the lamps on one or other of the systems there described. We should say 4,000 c.p. is a minimum for full-lengths and small groups. An important point, too, if you do any photographing of children, is that the lamps should be made to lower. (2) The address of the licence office, now administered by the Ministry of Labour, which applies to your district is: The Secretary, New Business Licences, New Arts Buildings, Liverpool. A form of application can be obtained at your local Employment Exchange. (3) Depending on the class of work, we think the camera should not be larger than whole-plate, and perhaps half-plate would do. You should have one with a repeating back or with one of the special backs allowing of a number of small portraits to be taken on a single plate, and postcards, etc., made by enlargement. This is very largely done now both by cheap and better businesses. For full-length cabinets and postcards a good length of focus is 11 ins., such as has the Dallmeyer 3 B. At any rate, if you do not want to pay the price of this lens (cheaper second-hand) we should advise either a less reputed portrait lens or an anastigmat of about the same focus. But for artificial light work the aperture should not be less than *f*/4.

The British Journal of Photography.

The Oldest Photographic Journal in the World.

PUBLISHED EVERY FRIDAY. Established 1854. **PRICE TWOPENCE**

TERMS OF SUBSCRIPTION, POST FREE.

United Kingdom.—One Year, 10s. 10d.; Six Months, 5s. 5d. Three Months, 2s. 9d.

Canada ... ...
Australia ... ...
New Zealand ... ...
South Africa ... ...
United States of America
South America ... ...
India and Far East ... ...
Continent of Europe ...

One Year. Thirteen shillings (13s.), or 3 dollars 17 cents, or 16 francs 38 cents, or 9 rupees 12 annas, or 6 yens 30 sens.

Federated Malay States, Borneo and Sarawak {5 dollars 57 cents.

Henry Greenwood & Co., Ltd., Proprietors and Publishers, 24, Wellington Street, London, W.C.2.

IMPORTANT NOTICE TO READERS.—Until further notice agents will supply the "B. J." to order only, as the high price prevailing for everything in connection with newspaper production prohibit the distribution of surplus copies for chance sales. It is therefore necessary in order to ensure the regular delivery of the "B. J." each week to place an order definitely with a dealer newsagent or bookstall clerk, or to send a subscription to the publishers.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3078. Vol. LXVI. FRIDAY, MAY 2, 1919. Price Twopence.

Contents.

	Page
Ex Cathedra	229
[illegible] Business Pitfalls	230
[illegible] in Photo-Engraving. By B. J. N.	231
Practice in the Studio. By Practicus	232
[illegible] for a Vest-Pocket Camera. By E. L. C. Mouse	234
Assistants' Notes	235
Patent News	236
Meetings of Societies	237
Forthcoming Exhibitions	238
Commercial and Legal Intelligence	238
News and Notes	238
Correspondence—	
The Fixing of Bromide Prints	239
The Late Sir William Crookes	239
Press v. Professional Photographers	239
New Sizes of Small Cameras and Plates Therefor	239
Answers to Correspondents	240

SUMMARY.

The eleventh Colonial and Foreign Number of the "British Journal" will be issued on June 6 next.

Given a sufficient response, a special section in this issue will be devoted to the announcements of situations wanted to those advertisers wishing to seek employment abroad. (P. 239.)

In his article this week "Practicus" deals with further matters connected with the use of portrait lenses in the studio, and has advice to give on the selection of focal length in relation to the character of the work and the size of the studio. (P. 232.)

A writer in "American Photography" has published his ideas of the features which he regards as essential in a camera of the vest-pocket type. These are: A construction which protects the lens against the need of a case, automatic spring into the position of focus, and focussing adjustment. (P. 234.)

In a leading article we deal with some of the somewhat indefinite [illegible] which, in the absence of recognition beforehand of their nature, may give rise to disputes. A frequent instance is the photography of club groups, whilst others relate to photographs unpaid for and to negatives taken but not used in executing a sitter's order. (P. 230.)

A contributed article deals with methods of dissection of the costs in the production of photo-engraved blocks. (P. 231.)

Working details of the methods for the repair of broken negatives are contained in a contribution to "Assistants' Notes." (P. 235.)

In working out a metabisulphite-hypo formula for a fixing bath which will begin to stain just about the time that it ceases to fix efficiently, use can be made of the strip of unexposed dry plate as a test of the latter condition. (P. 229.)

Changing boxes, living portrait photographs, and a camera attachment for aerial photography are among the patents of the week. (P. 236.)

Official details just published mark the enormous development of the Photographic Section of the Air Force. Only forty negatives were taken during the first month of the section's existence, whilst in October 1918, 23,000 negatives were exposed and 650,000 prints issued. (P. 238.)

"Colour Photography" Supplement.

Further details are given of the process and apparatus of Mr. Arno Hamburger for the production of complete colour cinematograph films. A colour impression is applied simultaneously to each side of the film band. (P. 17.)

The report of the lecture by Mr. S. H. Williams before the Royal Photographic Society very clearly shows the steps by which a graded colour filter such as that employed in the Joly process can be made by comparatively simple operations and apparatus. (P. 18.)

The current instalment of the "Decennia Practica" of colour photography contains further details of the Cheron process of photography in colours by prismatic dispersion. (P. 20.)

EX CATHEDRA.

The B.J. Colonial Issue. The eleventh Colonial and Foreign Number of the "British Journal" will be issued on June 6 next. Its special feature, which now, so we may believe, is fairly familiar to the photographic trade, is that it is printed in an extra edition identical with that circulating in the ordinary course, but which is posted directly to the number of 5,000 copies to photographers, photographic dealers, photo-engravers, and others throughout the British Empire abroad and in foreign non-enemy countries. The business-bringing power of the issues previously distributed on these lines is now an oft-told tale—a tale told to us again and again by advertisers who have repeatedly proved its truth. It is not too much to say that this one "B.J. Special" of the year is unique among issues of photographic periodicals in the volume of advertising it has carried and in the regularity with which the announcements of photographic dealing and manufacturing firms, large and small, have appeared in its pages. The proof of the pudding is in the eating, and firms in this country have learnt for themselves that a single announcement in this issue has brought them not merely many times the amount of their expenditure on it, but substantial additions to their circle of regular customers. With the release of industry from wartime restrictions it may be expected that the opportunity of addressing buyers of photographic goods whose wants have been scantily filled during the war will be embraced upon an exceptionally large scale.

* * *

Situations Abroad. It has been suggested to us by several photographic assistants that in the forthcoming Colonial and Foreign Number we should make a special section for the announcement of assistants who are seeking situations and are ready to go abroad. It may readily be believed that the experiences in different parts of the world which have been the lot of many assistants through their service in the Army have provided an inducement to many, who previously were confirmed stay-at-homes, to seek occupation abroad. In one or two of the early Colonial Numbers we introduced a section for announcements of this kind, of which a fair number appeared. In the present national conditions it is very possible that a much larger number of assistants are likely to announce their willingness to take posts in the Colonies or in other parts of the world. At any rate, if the number of applications of this kind is substantial we will certainly gather them in a special section, the title of which shall make it clear to the photographers into whose hands the issue comes that they are announcements by advertisers who are seeking jobs abroad. Assistants need not, therefore, go to the expense of stating this fact in their announcements, although they may advisedly mention the country for which

they have a preference. In any event they should state when sending the advertisement that it is intended to appear in any section of this kind which may prove of sufficient size to form a feature of the issue. The sooner such applications are sent in the better. On the general question a word or two may be said. It would be an ungenerous want of candour to lead any assistant to suppose that if he has not been successful hitherto in this country he will nevertheless be satisfactory to an employer in Auckland or Buenos Aires. Broadly speaking, the demand for quality of work and general efficiency is as insistent in the larger colonial and foreign towns as it is here. In Melbourne, for example, at any rate before the war, competition among photographic studios was even sharper than here. So that an assistant, so far as his employment is concerned, needs to guard himself from falling into the error that on the other side of the world he is going to have an easy time or to satisfy people, though he has not been able to satisfy employers here.

* * *

A Fixing Bath for Prints. The suggestion made by Mr. Albert O. Forrest in a letter last week is one which deserves to be kept in mind, since it is certainly one which should contribute to security in the systematic fixation of development prints. It will be remembered that Mr. Forrest advocates cutting down the metabisulphite in an acid fixing bath, containing only this addition to the hypo, with the object of causing the bath to give rise to stain by the time that its fixing properties are exhausted. It can be easily understood that the ratio of metabisulphite to hypo, namely, 1:18, which Mr. Forrest suggests is one which may vary with every individual set of circumstances. The degree of freedom of the developer from staining tendency will obviously modify it, as will also the photographer's practice of rinsing or omitting to rinse prints between development and fixing. But the suggestion is, as we have said, worthy of notice on account of the fact that it removes what is a real practical objection to a fixing bath which keeps free from stain as long as it is used. The hypo-metabisulphite formula is as good as any for the making of an acid fixing bath, and its modification on these lines is a measure both of economy and efficiency. The requisite quantity of metabisulphite could readily be ascertained by a few tests, using the strips of dry-plate which we have so often recommended as a rough-and-ready but sufficiently reliable test of the degree of exhaustion of a print-fixing bath.

* * *

Army Photography. From a White Paper recently issued by the Air Ministry we learn that photographic reconnaissance in 1914 was confined to two officers and three other ranks, whose outfit consisted of two cameras and a portable box of developing chemicals, while by the end of 1918 the personnel had increased to 250 officers and 3,000 other ranks. The increase in equipment and materials to the same date is not stated, but is probably quite proportionate. There must be a vast stock of apparatus and materials which on the final cessation of hostilities will not be required, and we trust that it will be made available for civilian use before it has hopelessly deteriorated. There has necessarily been much waste through imperfect storage during the war, but much of the material should be in good condition. As regards apparatus, the special cameras used will not be of much value to outsiders, but dealers and photographers would be glad to get hold of some of the lenses to tide over until our optical factories are in full swing again. There is another question to be considered—the disposal of the 3,000 more or less trained men. Many were photographers before the war, but a very large number will doubtless desire to take up photography in civil life. The openings in this direction have been greatly reduced by the large influx of women as operators, printers, and retouchers, and in the absence of any organisation there is grave danger of wages sinking to the pre-war level, a prospect which is not pleasing. The remedy would seem to be for the employers to insist on some standard of proficiency, and to pay a rate of wages commensurate with that ruling for skilled workers in other trades.

SOME BUSINESS PITFALLS.

The legal rights and liabilities particularly appertaining to their business may be said generally to be well understood by photographers. It is rare now to find ignorance of the facts as to ownership of the negative or of the sitter's rights in the non-display of his or her portrait. Even if a photographer may not be familiar with one express description of infringement as exhibition "by way of trade" contained in the Copyright Act, he knows it as a matter of fact, and is careful to ignore it only in those cases where he realises that objection is not likely to be raised by the sitter. But such considerations as these may be said to be the A B C of the law involved in the making and reproduction as exhibition of photographs which are taken in the ordinary course of business. There are others which are by no means so clearly or widely understood, partly from the fact that they are not so definite in character themselves, and partly that they are of less frequent occurrence. One or two of these, therefore, may well be the subject of a few notes, a glance at which will serve to tell the photographer what his course should be when the occasion arises.

Perhaps one of the most unsatisfactory problems which can arise, if the conditions involved in it are not recognised before hand, is in connection with the photography of groups and similar subjects. A typical case may be said to be somewhat on the following lines:—A photographer is asked to take photographs of, say, a cricket team. The order is that he should supply copies of the group to the team, and that therefore he should quote a price for the prints. Now, very often when the group comes to be arranged, it occurs to the photographer that a subject such as this is one which he could make use of in his own business in the way of selling prints or issuing postcards, and therefore it occurs to him to ask permission to make an exposure "for himself." No doubt whatever that when he makes this request he understands that the right to reproduce such photographs will belong to him and to nobody else. At the same time it is very likely not at all clear to the officers of the cricket club that in giving this permission they have conferred these rights upon the photographer. So at the start there is the material for misunderstanding. On the prints being made it is only natural that the photographer should submit proof from the negative taken "for himself." There is no reason why he should not, because obviously he has the right to supply prints if he so wishes. And the club most probably will not worry itself to draw any distinction between this photograph and those which it ordered, even if—which usually is not the case—it has the means of distinguishing the one from the other. Thus, the club may be supplied with finished prints of the photograph in which the photographer has, as he knows, the rights of reproduction. It is at this stage that the trouble usually begins. A common source of it is that the club, finding that large photographs are somewhat expensive, may send away a large print (the photographer's copyright) to somebody else to be copied and issued in, say, postcard form.

The club will think that as they paid for the prints they have a right to have them copied. The photographer, on the other hand, thinks quite the contrary, and when he finds that copies have been made he hastens to make a claim upon the club in respect to damages which he considers he has sustained. In such cases the question at issue is: Has he or the club the sole right to copy the photograph?

Now a dispute of this kind is very liable to be altogether unprofitable, from the fact that the evidence will be verbal evidence, and as likely as not, if the case were heard by a county court judge, the evidence of one side would be largely contradictory of that on the other. In the first place there is the uncertainty of identifying the photograph which the photographer, as he alleged, was allowed to take "for himself." And even if that could be identified, there is still an element of doubt, for the club may quite properly argue—and they could find considerable legal support for such an argument—that when they gave the permission it was with a view of the photographer supplying them with copies, not that he should publish copies broadcast. The photographer, on the other hand, will represent that certain photographs were taken by him to the order of the club, and that the club were liable for payment of the prints from them, whereas in the case of the special one "for himself" there was no such liability on the part of the club. It should be pretty evident that in circumstances such as these, where evidence may be flatly contradictory, and where also we are considering some of the most delicate refinements of copyright law, it is in the highest degree doubtful in whose favour a judgment is likely to be given. The moral of such a tale is that if a photographer is anxious to obtain copyright in one such special exposure he should obtain the written permission of the club for the work to be done, such statement briefly identifying the photograph, say, by the position of one member of the group, and also acknowledging the photographer to have the sole right of reproduction. If the confusions and uncertainties to which such transactions as this may easily give rise are recognised in advance, it is quite easy to draw up a simple statement which will remove altogether any possibility of subsequent dispute.

Arising out of such work as this—of photographing groups by appointment—are the annoying incidents which sometimes arise from some other photographer—very often a pressman with a hand camera—turning up while the group is being arranged and making a negative for himself. Perhaps this poaching upon the preserves of the appointed photographer is a less common thing than it was some years ago. However, it appears even on another page of this issue, where a correspondent points out that a newspaper journal calmly suggests that the pressman and the photographer who has been commissioned to take the group should carry out their work together—in other words, that the poacher and the gamekeeper should fraternise. There is, unfortunately, no remedy against men who are so deficient in the sporting instinct as to take advantage of the opportunity which another man has secured. Let the appointment photographer be under no illusion; there is no copyright, and can be no copyright, in the arrangement which he may give to a group of persons. In copyright law such a subject is a "work of nature," and it is not possible to obtain a remedy against a man who thus despicably profits by the skill of another. Competition of this kind, in the experience of many photographers, has yielded some amusing incidents, since the only effective preventive of such practice is to get someone continuously to obstruct the view of the interloper's camera until the legitimate photographs can be made and the group dispersed.

In conclusion, a word or two may be said on conditions which constantly arise in the ordinary course of business of a photographic studio. Sometimes it may happen that a sitter does not pay for the photographs which have been made, and thus a photographer, failing to obtain payment without recourse to legal means, may think to himself that, as he has not been paid for making the pictures, the copyright in them belongs to him. Such is a complete error. As can be seen in a moment by anyone who has realised that the beneficent laws of England are made for the profit of lawyers, the real law of the matter is that if the sitter does not pay he or she can be sued for the money by the customary legal methods, but at the same time the sole right to reproduce or exhibit the photograph belongs to the sitter. In law, we believe, no distinction would be drawn between a sitter who does not pay because he or she thinks that the photographs are unsatisfactory and one who accepts the prints and endeavours to evade payment. Somewhat closely related to the same minor problem is the case of the surplus negative—that is to say the negative or negatives which are made at a sitting, but which are not used in carrying out the sitter's order from one reason or another. The question is referred to because there have been cases in which the photographer has claimed the rights of reproduction in such negatives. Legal judgments have, however, firmly established the contrary, on the ground that the payment made for the supply of the prints was a consideration for the whole labour of the artist, and that therefore such payment covered both the photographs which were approved by the sitter and the others which were not.

COSTS IN PHOTO-ENGRAVING.

It may be useful to outline a cost system which gives the facts, as operated in a small establishment in America having seven men (including artist) on the shop pay-roll.

When a job comes in a duplicate numbered job ticket is made out; one goes with the copy and the other remains in the office.

Every workman has a daily time card. When he starts in the morning he stamps his card in a Baird time clock and picks up his job. As soon as he has finished his part and passes this job on he stamps his card in the time clock and writes the number of the job in the space between the two lines, which thus mark the time he commenced and the time he finished, and this shows the time in hours and tenths he has spent on that particular job. The same with every job he tackles during the day. If he is not working on any numbered job, but doing something else, such as making-up chemicals, he marks the card "Miscellaneous." This card, therefore, shows the chargeable hours shown by the job numbers, and the time without job numbers is non-chargeable time.

The next morning the stenographer collects the time cards, and transfers the time shown on the time cards to the various job ticket duplicates, according to the number of the job. So that at any moment it can be seen how much time has been spent upon any particular job up to the night before. The "Miscellaneous" or non-chargeable time is entered up on a separate sheet under each man's name. When the engraving

is completed it is brought into the office and measured up, and the square inches also noted on the job ticket, in order to calculate the material used per square inch sold.

The material used is arrived at by careful stocktaking on the first of every month. The stock in hand at the first of last month, plus the amount purchased during the month, less the amount left at the first of current month, shows the amount consumed during the previous month. This value divided by the number of square inches sold gives you the value of material per square inch. It varies from month to month from 2 cents (1d.) to 4 cents (2d.), but it averages up over a year to nearly 4 cents (2d.).

Having the productive labour on every particular job and the material cost, we have now to add our overhead or burden, which consists of all other expenses—the non-chargeable time, supervision, office charges, rent, rates and taxes, insurance, advertising and selling expenses, depreciation of machinery, interest on investment, and, in fact, every other expense.

These three items—labour, materials, and overhead—added together give you the cost, and the difference between this total and the selling price gives the profit or loss on any particular job.

Now, there has been a great deal of discussion concerning the method of apportionment of the overhead on each particular job, and, on the whole, it would seem to be simplest in a small establishment to add all the overhead items together and divide by the number of chargeable hours, and add the sum found to each chargeable hour. Thus a month having 1,000 chargeable hours and total overhead expense of $750 equals 75 cents per chargeable hour, and if any particular job has ten hours' labour on it, $7.50 cents, is added for overhead to the cost of labour and materials to make up the toal cost. This, of course, is not ideally fair, but it is fairer than charging a percentage on the labour cost, because thus the overhead on the cheaper man is less than the overhead on the expensive man, whereas both require the same space, and frequently the cheaper man requires more supervision. On the other hand, it ignores the extra overhead the job needing the use of machinery ought to pay, and this is spread over all the chargeable time; but as 10 per cent. per annum depreciation cost of machinery is not very considerable, and some of the machinery is used on nearly every engraving, it is scarcely worth while to separate this item. The overhead varies every month according to the number of chargeable hours worked, ranging from 68 cents (2s. 10d.) in the busiest time to $1.30 (5s. 5d.) in the slackest month. It averaged the first half of last year 75 cents (3s. 2d.), and we used that figure for the next half-year; the figures ascertained by the half-year's costing will be used for next half-year.

The inventory, if taken carefully, will show exactly what waste has taken place. For example, on the average 35 per cent. more metal was purchased than the square inches sold, and some months this has gone up as much as 45 per cent., and has never gone down lower than 25 per cent. It shows the cost of metal is one-third the cost of all materials; it will also show fluctuations in the consumption of any materials. For example, silver nitrate: the average monthly consumption of this chemical is $7.74 (£1 12s. 4d.), but it varies from $4.34 (18s.) to $14.50 (£3 0s. 5d.). When a high consumption like the last is shown, naturally, some explanation will be called for.

The usual way of summarising the cost in the photo engraving is to take the shop pay-roll (calling it labour), then materials, and then overhead, which includes all the other expenses. As has often been shown, the rough average from many establishments on this basis is: labour, 50 per cent.; materials, 15 per cent.; overhead, 35 per cent.; and our figures were very close to this average at first, but last year the percentages worked out rather differently; they were: labour, 47 per cent.; materials, 11 per cent.; and overhead, 42 per cent. This is due to the fact that a good many duplicates have to be made and the negatives are stripped on to Kodaloid and saved and used over, so that the labour, time, and the material used in making the negative is saved, whereas the establishment expenses remain the same; therefore overhead goes up in relation to the cost of material and labour. Overhead is really a much higher percentage than is shown on this scheme, because the non-chargeable hours part of the shop pay-roll which is overhead is included in labour, instead of overhead, and it is never less than 15 per cent. of the pay-roll.

A. J. N.

PRACTICUS IN THE STUDIO.

[Previous articles of this series, in which the aim of the writer is to communicate items of a long experience in studio portraiture, have appeared weekly since the beginning of the present year. It is not thought possible to continue the series to the length of that by the same writer which ran through the "British Journal" some years ago, but if any reader among the younger generation of photographers, and particularly those engaged as assistants, has a particular subject which might be dealt with, his or her suggestion will be welcomed. The subjects of the previous articles of the series have been as follows:—

A Talk About Lighting (Jan. 3).
The Camera and the Lens (Jan. 10).
Managing the Sitter (Jan. 17).
Backgrounds (Jan. 24).
Studio Exposures (Jan. 31).
Artificial Lighting (Feb. 7).
Printing Processes for Portraiture (Feb. 14).
Studio Accessories and Furniture (Feb. 21).
The Surroundings of the Studio (Feb. 28).
Studio Heating and Ventilation (March 7).
The Postcard Studio (March 14).
The Printing-Room (March 21).
About the Reception Room (March 28).
Home Portraiture (April 4).
Portable Studios (April 11).
Copying (April 18).
Handling the Studio Camera (April 25).

MORE ABOUT LENSES.

Although the lens is the most important and usually the most costly item in his outfit, the average portraitist has very hazy ideas as to its powers and qualities. If he is a cautious man and plays for safety, he is usually satisfied with getting lenses similar to those which he knows have been used successfully by others; while if he has more enterprise and cash than he has experience he will procure the latest thing in anastigmats, which may or may not be the most suitable for his work.

In choosing a lens for professional portraiture there are three vital points to be considered: focal length, working aperture, and quality of definition. I will deal with these seriatim.

It cannot be too often repeated that the perspective or "drawing" of a picture depends upon the distance between the eye of the artist, or, in the case of a photograph, the lens of the camera, and the model. If this distance be short

the perspective will be abrupt, while if it be too great there will not be sufficient convergence of the lines to give an impression of solidity. The first condition exists frequently, the second rarely. This leads us to our first point, the selection of a lens of suitable focal length. For this we must first decide the minimum allowable distance between lens and sitter when making the largest head which is likely to be required, and this is generally put at 6 ft. To find the focal length the first thing to be done is to divide the actual size of the sitter's head, which we will say is 9 ins., by the size it is to appear in the negative, say 3 ins. This is a reduction to one-third, and according to the well-known rule for this we must place the lens at four times its focal length from the subject. But as we have already fixed the distance as 6 ft., we must divide that by four to obtain the equivalent focal length of our lens, and this, of course, is 18 ins. I have given these measurements as an example, but as a matter of practice 18 ins. is a very useful focal length for general work, provided that the studio is of average length. In a short studio it would be impossible to make full-length cabinets with it, and it would be close work even for half-lengths. In many studios a 16-inch lens is preferred, and will answer very well if not pushed too far with large heads. Unfortunately, it is difficult to judge the amount of what we must call distortion by looking at a print. The photographer himself cannot see it in the absence of the sitter, but the sitter's friends can see it and condemn the likeness, although they are unaware of the cause. This is, I believe, one of the reasons why small portraits are usually more acceptable, and often have to be enlarged, although larger direct negatives are available. A little experiment which will be instructive to the photographer who has no knowledge of the theory of perspective can easily be made. Instead of a sitter's head place a cubical wooden block or cardboard box with 9-inch sides, and photograph it with a 9-inch lens, one angle being turned to the camera, so that a 3-inch image is obtained. Then repeat the operation with an 18-inch lens and compare the results. The difference is striking, and although not so immediately apparent, exists to the same extent in two portraits taken under the like conditions. Of course, a portrait lens is not necessary for the experiment; a 8½ or 9-inch R.R. will answer, using the complete lens for one exposure and one of the components, either front or back, for the other. Those who have access to T. R. Dallmeyer's "Telephotography" will find an excellent pair of examples, the subject being a half-length portrait, taken with a 16-inch lens and a telephoto lens respectively. My advice is not to try to do everything with one lens, but to use an 18-inch for all work within its scope and to procure one of shorter focal length, say 10 or 12 ins., for small full-lengths.

I now come to working aperture, another important factor, especially as regards cost. Almost from the inception of photography opticians have turned out big lenses with big apertures, because photographers asked for them and were willing to pay big prices. Practically, I do not think that a larger aperture than *f*/5.6 is needed for lenses of 18 ins. or more, as the lack of depth that is present at larger openings is sufficient to spoil any portrait, especially if taken at close quarters, when rapidity would be most needed. With smaller lenses much larger apertures are allowable, as these are often required for small portraits of children, where the distance from the subject and the shorter focal length aid in giving depth when speed is the all-important consideration. Thus I consider such lenses as the Dallmeyer 3B and the various *f*/3.5 12-inch anastigmats of other makers as invaluable auxiliaries to a larger lens. Do not think that depth of focus is in any way affected by lens design. It is absolutely a matter of relative focal length and aperture, and a poorly made lens often gives greater apparent depth than a good one, but of this I will say more later on.

One has only to look at any representative collection of modern portraits to see that there is now no rigid standard of definition as there was a few years ago. The ordinary person is getting educated into the appreciation of soft definition, and pictures which formerly would have been rejected are now accepted as orthodox. Of course, the standard of definition will vary with the class of clientele, and I would certainly not advise the postcard artist to invest in a Port-land or Puligny-Puyo any more than I should suggest that a short-focus portrait lens was the correct thing for Bond Street. However, the general tendency is in favour of less critical sharpness than we saw formerly, and this is all to the good, for it minimises retouching and gives a better chance to the general effect of light and shade.

There is now available so great a variety of lenses, rapid enough for portraiture, that it is rather bewildering to the novice. First we have the portrait lenses of the Petzval and Dallmeyer types, with which nearly all professionals are familiar. These give intensely sharp definition over a comparatively small area, the marginal definition being spoiled by curvature of field and astigmatism. The former defect may be cured by reducing the aperture, but the latter cannot. I may say that for some subjects a lens with a curved field scores over all others. For example, a three-quarter length sitting figure can be better rendered with a curved field lens which is practically free from astigmatism than by the best modern lens and the swing back. Fortunately curvature of field and astigmatism are seldom, if ever, present in an aggravated form in the same lens. If it be desired to choose between two lenses it is easy to tell which has a round field and which has astigmatism by focussing a small flame, or even a disc of white paper on a black background. If astigmatism be present, it is impossible to secure a sharp image on the margin of the plate, no matter how much the screen is moved. The image of the flame or paper disc will be distorted one way or the other as the screen is moved to and fro, and at the neutral point it is unsharp. With a round-field lens it is easy to obtain sharpness at the margin, but at the expense of central definition. With sitting figures this is just what is wanted, as the nearer parts of the subject fall on the margins of the plate, and the head near the centre. When a similar subject is taken with a good anastigmat it is possible to get the head and knees sharp by using the swing back, but the body will be out of focus if a large aperture be used.

We now come to the question of spherical aberration as affecting definition. If we attempt to focus a very finely engraved line subject or a page of very small but sharp type, and find that we cannot obtain critically sharp definition at the full aperture of the lens, it may generally be assumed that spherical aberration is present. If in large quantity a halo will be visible around larger type, or, in the case of a male sitter, round the white collar. This is clearly seen with the Portland and Bergheim lenses. It usually disappears on reducing the aperture to *f*/16. Now, properly used, spherical aberration is a very good thing, and many portrait lenses are now made so that any desired quantity can be introduced. This is effected by altering the distance between two of the component glasses, and to do this we turn the back cell in the Dallmeyer model and the front one in the Cooke. We can by this simple adjustment obtain any degree of diffusion, from nearly sharp to quite fuzzy. For professional work I am in favour of lenses of this description rather than those made specially for soft focus work, as the latter are more limited in their application, and cannot be used for sharp pictures requiring short exposures.

Child portraiture, while one of the most remunerative

branches of our work, is also one of the most difficult, and it is well to be provided with a very rapid short-focus lens, which can be used in a poor light or with very restless youngsters. I have found it well worth while to keep a special "baby camera" always ready for use. This is of the ordinary studio type fitted with a 9-inch portrait lens working at *f*/3, and one of Dallmeyer's rapid cabinet attachments. This combination makes work very easy, as it is possible to work fairly close up and yet get fairly good depth. Only full-lengths or fairly small heads should be attempted, as these can easily be enlarged. I can recommend this course, as I have thus saved hundreds of re-sittings which would have been necessary by attempting to work in the ordinary way, besides getting a reputation for being "clever with children."

In recapitulation, I suggest as a serviceable outfit for work up to whole-plate size and for 12 x 10 full lengths, an 18-inch lens with an aperture of *f*/6 and a soft focus adjustment for the bulk of the work, an 11 or 12-inch lens working at *f*/4 for full-length cabinets and C.D.V., and, if possible, an extra-rapid 9-inch lens for young children. Any or all of these may be anastigmats, as these may, if necessary, be used for ordinary outdoor work as well as for portraits. Portrait lenses of the ordinary type are not so available, as nearly all of them will give a flare spot when used with a small aperture in bright light.

PRACTICUS.

SPECIFICATIONS FOR A VEST-POCKET CAMERA.

[The study of the features desirable in the vest-pocket camera, which we quote from our contemporary, "American Photography," is one which must have been written without a full knowledge of what English makers have done. The three features which Mr. Morse declares to be unrealised in any single camera are, we think, embodied in at least one camera here; if not in the precise form which Mr. Morse specifies, at any rate in one which is its practical equivalent.—EDS. B.J.]

In a passage that becomes more and more significant as time goes on, Alfred Watkins, the English photographic expert, speaks of his preference for a whole-plate camera, but is willing to concede that a 5 x 7 camera might possibly be used in its place, if one seriously objected to the weight of a larger camera.

Since those days, much water has flowed beneath the photographic bridge, and few people ever think now of packing about a 5 x 7 camera, except for some specific and unusual occasion. In fact the tendency is distinctly towards a rather small camera, a movement that was perhaps inaugurated in Great Britain by the Shew XIT and the Houghton Ensignette cameras. Some ten or a dozen years ago I wrote to some American camera manufacturers suggesting smaller cameras; they replied that there was no market for such a camera. To-day the woods are full of them.

The amateur photographic public is evidently getting educated to the possibilities of the small camera. Possibly the economy enforced by the war was largely responsible. At any rate, the so-called vest-pocket camera is having a large and increasing sale. The American film camera has now reached a stage of excellence such that further considerable improvements seem unlikely. The vest-pocket camera, however, has several points that need improvement, and I propose to point out some deficiencies in those now on the market.

First let us consider what the V.P. is used for, where, when and how. The size of picture is about 1½ x 2½ inches. The camera is about 1 x 2½ x 5 inches. Its weight is from eight to ten ounces. It easily fits into the upper vest pocket of a man's clothes, opposite the heart or on the other side, provided the usual size pocket is enlarged to fit the camera. On a hot summer's day it probably had better not be carried so close to the body.

The V.P. is pre-eminently a snapshot camera for the expert worker. In fact the smaller the camera, the greater the skill of the operator must be to obtain good results. It is a camera particularly adapted for genre work—pictures that show up suddenly and disappear again; a policeman holding up an impressive hand while a dainty little miss crosses the avenue through a lane of snorting autos; or a boy playing with a dog; or a railroad crew in from a long run, straining their eyes for the signalman's orders. All this requires the trained eye and the artistic sense as well as the trained hand.

For this reason the V.P. ought to have a mechanism which operates with a minimum of complications in opening and getting ready. The closing of the machine may be as leisurely as one wishes. Therefore a type of machine that requires a carrying case for the protection of the lens is to that extent defective. The case adds one more complication and consumes the fraction of a minute that may be fatal to the picture. Such pictures won't await the photographer's convenience.

On taking the machine from the pocket, the pressure of a button ought to cause the lens to fly into position without further ado. The practice, all well enough with larger cameras, of reaching in and hauling out the bellows by hand and setting the pointer at the distance desired has to be abandoned with the V.P.'s. In the majority of cases the infinity mark is satisfactory, but not always. In fact it is a distinct advantage to have a disc turning arrangement so that the distance can be set wherever desired.

Sometimes you don't want too distinct a background. Take the case above cited of the young lady going across the street. There is no need that every detail on the opposite side of the street should stand out distinctly enough to distract one's attention; signs, Liberty Loan placards, and cabs waiting for fares. To be specific: if you have a 3½ inch lens (as most V.P.'s do) you set the focus at 25 feet, which embraces everything in the field between say 15 and 95 feet with an *f*/7.5 lens; or 15 and 65 with an *f*/6.3. For this reason, the best camera of the V.P. style must allow focussing.

So far as I know, at the present time there is no V.P. camera on the American market embodying all the following desirable features:

(1) Needs no carrying case for protection of the lens.

(2) Springs automatically into operating position by pressure of one button.

(3) Has a focussing arrangement operated by a disc in the lens front.

Some of the V.P.'s offered for sale have two of the three points mentioned above; some have one, and some, alas! have none.

A V.P. camera requires a good lens, preferably an anastigmat working at about *f*/5.6, more or less. An *f*/4.5 lens requires pretty careful focussing and runs into money. A shutter that would really and truly give say 1-10, 1-25, 1-50 and 1-100 second would be sufficient. Most shutters are, sad to relate, fearful and wonderful liars. But a shutter is something like an astronomical clock; it need not tell the exact truth; what is wanted is to know how much it varies from the truth and arrangements can be made accordingly. By the way, why doesn't some enterprising American make a business of test-

ie shutters? Some of us would be willing to pay a reasonable price to "know the worst" about a favourite shutter.

The miniature camera naturally suggests the enlarging machine. Pictures can be enlarged, after a fashion, by daylight boxes, but they allow no variation of size or manipulation of printing effects.

At the present time the American manufacturers are woefully behind in enlarging machines; what we have are crude and expensive. It is to be hoped that in due time manufacturers will see the advantage of a first-class artificial light enlarger to keep pace with the small camera. An enlarger is almost a necessary complement to the vest pocket camera.

The V.P. camera will probably never become as popular with the multitude as the larger sizes. The average amateur photographer wants a direct print large enough to see everything distinctly. In the hands of an expert the V.P. will do the very best kind of work and allow an enlargement up to say 5 x 7. It is by no means a toy. In fact one has to graduate from a larger camera in order to be capable of using the vest pocket instrument. But the graduating class is growing every year, and the demands for first-class V.P. cameras will probably be steady and increase in volume year by year.

E. L. C. Morse.

Assistants' Notes.

Notes by assistants suitable for this column will be considered and paid for on the first of the month following publication.

Repairing Broken Negatives.

What can there be more annoying than to see a cherished negative lying on the floor in pieces, and how often, I wonder, are those pieces confined to the waste bin. Tempers are ruffled, customers disappointed, orders, money, and business lost; yet, with a little manipulation, the effect of a broken negative catastrophe can be overcome. All the necessary materials for overcoming can, or should be, found amongst any photographer's equipment. These materials consist of two or three grades of retouching pencils, a retouching knife or two, and some spare plates of a medium rapidity.

The method of procedure is as follows, and with ordinary skill the damage can be made good.

First retrieve from the floor or other resting place all the pieces of negative, and then carefully piece them together on a clean piece of glass of a size larger than that of the broken negative. For instance, if one is repairing a half-plate negative, then 7 x 5, or even whole-plate, should be used. Having pieced the broken pieces together, next fasten the outer edges securely to the glass bed by narrow strips of adhesive binding—Dennison's lantern slide binding, sold in twelve-yard rolls, will be found admirable for the purpose—taking care that other pieces inside are not moved out of position. Our next step is to make a transparency on a medium speed of plate somewhere about H and D 150—180. Transparency making is not at all a difficult undertaking providing one does not "get the wind up" by using too strong an illuminant for making the exposure. I have made hundreds of transparencies by means of an ordinary match—a wax vesta is ideal. Of course, this method is open to criticism, so there is no hard and fast rule why one should adopt this method, but I give it here as a guide for those who are not used to the making of transparencies. The bound-up negative should be placed in a printing-frame with an unexposed plate in contact with it, film to film. It is a good plan to lay a narrow strip of glass round our bound-up negative in the printing-frame to equalise the pressure when the back is put on and fastened down, thus preventing undue pressure on the centre of the frame. Without these strips there is a tendency for the cover to crack, thus adding to one's annoyance by a double catastrophe. Having loaded the frame, stand it end up on the edge of the dark room bench. Now strike a match, shielding the direct rays from the frame, and when the match is fully alight move it round in a circular motion about six inches away from the frame so as to ensure as even an illumination as possible. Should one part of the negative be denser than another, the match can be held closer to and opposite the particular part for a moment or two longer than the remainder.

Remove the exposed plate from the frame and develop in any non-staining developer, the borax metol-quinol formula of Messrs Wellington and Ward being very suitable, as it produces negatives and positives of a very fine grain and free from fog or stain. For those who may not have a copy of the formula by them, I give a copy of it here as published in their handbook :—

Water (hot)	20	ounces or	500	c.c.
Borax (powdered)	200	grains or	10	grammes.
Metol	20	,,	1	,,
Hydroquinone	50	,,	2.5	,,
Sodium sulphite	200	,,	10	,,

Dissolve in the order given, allowing each chemical to be in complete solution before adding the next. This developer keeps, by the way, almost indefinitely in well-stoppered bottles.

When our positive is fully developed, fix and wash in the usual manner.

Of course, our positive will show the cracks and lines of breakage, but it is here where the only skill required will come in, and this with the use of a retoucher's knife and pencil. The pencils I prefer are grades 2 and 3, and for work requiring a good black deposit a No. 1 will be useful. The best knives to use for the purpose are those sold by T. S. Pruce. Failing these, surgeons' scalpels will be just as useful. The knives most suitable are Nos. 1 and 2, and for fine work a No. 4 is handy to have by you, although a great deal of the work can be done by the first-mentioned grades.

Place the positive on a retouching desk, and with the knife most suitable for the purpose carefully remove the black lines until they are of the same density as the other surrounding parts. This action of reducing the density of these black lines is by the gentle and light process of scraping the film of the positive. On no account should any pressure be used on the knife, otherwise the work will result in a series of rough scratches resulting in an uneven printing density. Take great care not to remove all the gelatine film when scraping, otherwise one will find it very difficult to apply the pencil there afterwards if necessary. Having got rid of the black lines, cover the negative with retouching medium and fill and even up the white spaces with the retouching pencil, preferably by means of cross hatching. If the crack has extended across the face, carefully remove the blemish first with knife, finally finishing off with the pencil. When the positive is worked up and retouched to your satisfaction, varnish it with a good hard drying negative varnish. By varnishing a negative, one not only protects the film from further damage, of scratches, etc., the varnish also tends to even up any work that has been done with either the knife or pencil, and makes it less noticeable in the new negative when made.

A new negative is made by repeating the method adopted for making the contact positive—barring the necessity of fastening the same down on a cover glass. If the knife and pencil work has been carefully done on the positive, our new negative should require very little after work. Should such work be required, repeat the method of treatment of the positive, and, as before, finally varnish.

With a little practice on some old negatives it is surprising what can be done in shorter time than it takes to describe. The whole process is very simple, and an intelligent retoucher can soon convert what appears to be a total loss into an article of value once more.

I might mention here that however carefully the work might have been done, the final negative sometimes looks a little uneven in density owing to the black colour of the pencil work printing a different tone to that of the negative in general. For contact work this is not very detrimental, as the print can easily be evened up in the final spotting, but if enlargements are required the handwork may be rather pronounced.

Should enlargements be required, make a print on glossy bromide about half the size of those required, match up some spotting colour (to which a little gum water has been added) to the exact tone of the glossy print, and carefully spot same, preferably with the aid of a magnifying glass. When completed, copy in the ordinary way.—Benjamin F. Welch.

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Applications, April 14 to 17:—

POSTCARD PRINTER.—No. 9,523. Photographic postcard printer. R. N. Kerr and F. W. Tassell.

DEVELOPING TANK.—No. 9,608. Daylight developing tank for photographic plates. S. G. Killick.

CINEMATOGRAPHY.—No. 9,788. Cinematographs. A. Page.

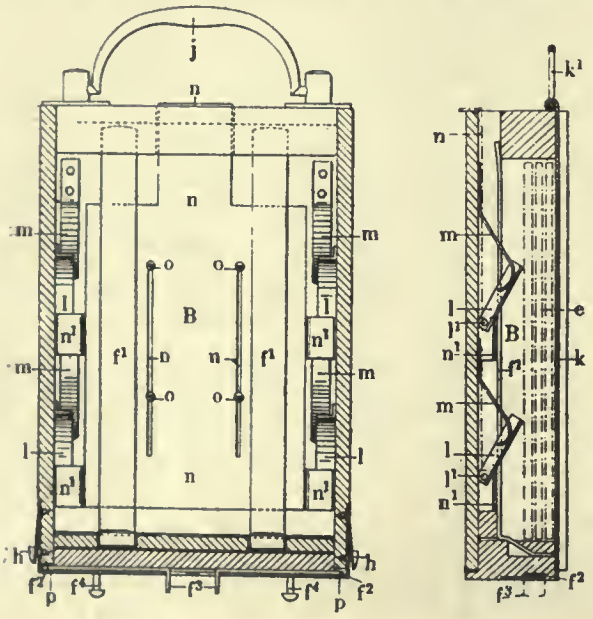
CARBON-HOLDERS.—No. 9,822. Carbon-holders for arc lamps for cinematographs. F. A. Thomassin and G. Williams.

COMPLETE SPECIFICATIONS ACCEPTED.

These specifications are obtainable, price 6d. each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

CHANGING BOXES.—No. 120,910 (November 12, 1917). The invention relates to a changing box which allows plates to be changed in daylight. The apparatus comprises a store box, a changing box, and a loading slide. The store box receives in the dark-room the unexposed plates, which, after being exposed in the camera, are replaced in the store box to await development. The store box comprises for this purpose two compartments, one for taking the unexposed plates and the other for receiving the exposed plates. The changing box receives the loading slide charged with the plates, and is put in its place on the camera. The loading slide serves for transporting the unexposed plates from the store box into the changing box, and for bringing the plates back again from the changing box to the store box after



they have been exposed. The loading slide, which is so contrived as to be capable of being separated from the changing box and fitted on to the store box and conversely, constitutes the chief part of the invention.

The loading slide consists of a frame *i*, open on one face, and provided in addition with another opening at the bottom. A handle, *j*, serves for operating this loading slide. The front aperture is closed by means of a sliding shutter, *k*. On the panel opposite to the shutter, inside this slide and at the side thereof, there are pressing members, consisting of arms, *l*, pivoted at l^1, and extended by means of springs, *m*. These pressing members serve to ensure the plates, *e*, which are enclosed in the ordinary sheaths, passing out of the slide after the shutter, *k*, is raised. A sliding member, *n*, provided with lugs or cleats, n^1, enables the pressing members to be thrown back for the purpose of rendering the device stationary. This sliding member, *n*, is guided in rectilinear displacements by screws, *o*, engaged in slots, *n*, formed in the sliding member. Charles Rothmeyer, 23, Boulevard de Canal, Aulnay-sur-Bois, Seine et Oise, France.

LIVING PORTRAIT PHOTOGRAPHS.—No. 114,173 (August 16, 1917). The invention is an improved method of making the "living portrait" photographs, made by exposure of a plate in separate series of bands through a (shifted) ruled screen.

The positive is made on celluloid, which is mounted on the back of an opening in a front card. A sheet of ruled paper with the lines thereon similar in character to the lines on the screen through which the negative was made is placed on the front of a back card. It will be seen that this method of manufacture is the reverse of the method usually employed.

For keeping the ruled screen in contact with the positive the back card is embossed, so that the central portion of the ruled surface is pressed outwardly into engagement with the inner face of the celluloid positive.

In the drawings there is shown a back card or mount 50, on the front of which is printed or attached ruled lines 51. In front of the back card is the front card or mount 52, having an oval or other opening therein, and at the back of the front card

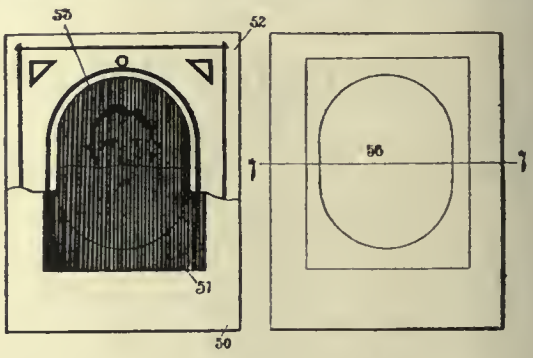


Fig. 1. Fig. 3.

attached a celluloid positive 53, having the banded pictures thereon. Flexible strips 54 and 55 of fabric are attached to the edges of the cards for the purpose of binding the two cards together and also allowing lateral movement of one card relative to the other. The placing of the ruled lines 51 on the back card 50, and the placing of the celluloid positive 53 on the back of the front card 52, results in an animated photograph that is free from shadows. In Figs. 3 and 4 there is shown an improved back card for use in the manufacture of animated photographs. While the structure illustrated in Figs. 1 and 2 is efficient, it has been found that with use the flexible connecting strips 54 and 55 stretch, and it is

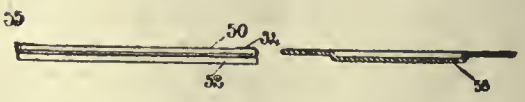


Fig. 2. Fig. 4.

necessary to press the back card into engagement with the back of the front card in order to get the best results. To avoid this difficulty the back card is embossed in the manner shown, the embossed portion being designated by the numeral 56. With this construction the front and rear cards are grasped naturally between the thumbs and forefingers to manipulate the cards and display the pictures. Reginald Ignatius Atherton, 16, Cavendish Avenue, Church End, Finchley, London, N.W.; David Burne Jones, 6, Lansdowne Grove, Neasden, London, N.W.; and Sidney Croneen, 67, Hornsey Lane, London, N.

DISTORTED PHOTOGRAPHS.—No. 116,727 (October 3, 1917). In producing, by photography, a humorous picture or series of pictures a non-spherical lens or a lens formed of two or more portions optically diverse from one another is so mounted that it may be rotated about an axis transverse to its general plane. The lens

may be fitted to a cinematographic camera and rotated during the exposure.

One method of carrying out the invention is shown in the drawing. The method may be carried into effect by a camera fitted with a lens such as that indicated at K in the drawing. This lens is composite, being formed of three distinct portions, which may either be integral with one another or formed separately from one another, and suitably cemented together. Each portion is different from the other in its optical value; thus the portion K^1 may be of spherical formation with a positive curvature, the portion K^2 of cylindrical formation with a positive curvature, and the portion K^3 have a value differing both from that of the portion

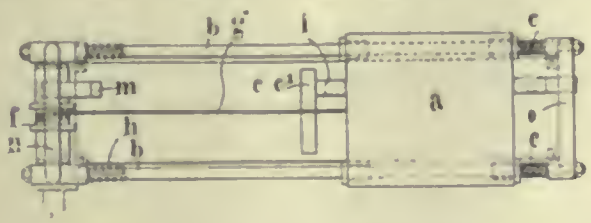
K^1 and that of the portion K^2. Any combination of diverse curvatures may be employed, and any number of distinct portions may be used in the lens. Diversity may be obtained merely by diversity in degree of curvature or by diversity in degree as well as in kind.

In order to enhance the humorous character of the photographs when a series is to be taken, the lens is rotated about the centre, K^4, and exposures taken through the lens in successive positions thereof. Thus, for example, for a cinematograph film the lens is slowly rotated while the object to be photographed performs movements before the camera. The lens may be a simple cylindrical lens, and be rotated about an axis transverse to the axis of the cylinder. William Henry Baker, 32, Hatton Garden, London, and William Millward, 34, Butler Street, Chorlton-on-Medlock, Manchester.

Cinematograph Film.—No. 117,887 (February 8, 1918). This invention consists in a film the edges of which are reinforced by sewing to them adjacent to the feed openings one or more continuous threads of silk, cotton, or the like, which effectively prevent the edges or the whole film from getting torn. Hubert Degens, Maastrichterlaan 45, Vaals, Holland.

Aerial Photography.—No. 115,136 (June 27, 1917). The invention consists in arranging a camera in or upon a frame or structure so that it is capable of movement therein (at a rate which may be adjustable), and in adapting the camera to travel over a stationary screen or shutter having an aperture to give the required time of exposure, so that when taking a photograph the camera may be set to travel at such a speed that it will at the moment of exposure of the photographic plate be stationary, or moving only with a low velocity relatively to the object being photographed.

In the drawing, the camera *a* is mounted in a slide-like manner upon a frame which may consist of guide rails or rods *b*, a



stationary shutter *c* being arranged in the frame and clipped thereto, so that it comes between the lens and the photographic plate, but adjacent to the latter in order to give the advantages of a focal-plane shutter. The gap or slot c^1 in the shutter is proportioned so as to give the required time of exposure. The camera is moved over the shutter at a speed which may be adjustable, by springs, compressed air, or other means, buffers and other devices being employed to bring it to rest and also to prevent recoil at the end of its traverse. In the figures, compression coil springs *e* assisted by a spring-rotated drum *f* acting on the camera through a flexible element, serve to traverse the camera from right to left. The springs *h* serve as buffers to bring the camera to rest without shock. Edgar Duerr, Bella Vista, Langham Road, Bowdon, Cheshire.

Trade Names and Marks.

REGISTRATIONS RENEWED.

Train and Camera (Design).—Nos. 271,453-4. Registered by the Paget Prize Plate Co., Limited, in 1905. (Classes 1 and 39.)

Nobrah.—No. 272,979. Registered by Kodak, Limited, in 1905. (Class 1.)

TRADE MARKS REMOVED FROM REGISTER.

In the official language of the "Trade Marks Journal" the following trade marks have been "removed from the register through non-payment of renewal fees." Such non-payment is, of course, the method adopted by a firm having no further occasion for the use of a mark:—

Mattos.—No. 270,171. Registered by Mattos, Ltd., in 1905. (Class 1.)

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Saturday, May 3.

Hackney Photographic Society.—Outing: Woolwich to Greenwich.

Monday, May 5.

City of London and Cripplegate Photographic Society.—"Printing Processes." A. Dordan-Pyke.
South London Photographic Society.—The 1918 A.P. Competition. Lantern Slides.

Tuesday, May 6.

Royal Photographic Society.—"The Carbon Process." The President.
Hackney Photographic Society.—Lecture by T. H. B. Scott.
Manchester Amateur Photographic Society.—Beginners' Night. "Hand Cameras, Ancient and Modern."

Wednesday, May 7.

Croydon Camera Club. "Psychic Photography." J. Coates, Ph.D., F.A.S.
Edinburgh Photographic Society. Nominations.
Tunbridge Wells Amateur Photographic Association.—"Autochromes." R. J. Sells.

Thursday, May 8.

Hammersmith Hampshire House Photographic Society.—"Some Photographic Reminiscences." W. E. Walker.
Richmond Camera Club.—Annual General Meeting.
Hackney Photographic Society.—Outing to Waltham Abbey.

ROYAL PHOTOGRAPHIC SOCIETY.

Meeting held Tuesday, April 29, Mr. T. H. B. Scott in the chair.

A lantern lecture was delivered by Mr. W. J. Roffey on the "Cathedrals of Ely, Litchfield, Gloucester, and Wales." Mr. Roffey, to the accompaniment of a large number of excellent lantern transparencies, discoursed on the architectural and historical features of his ecclesiastical subjects. On the proposition of the chairman a hearty vote of thanks was accorded to him.

CROYDON CAMERA CLUB.

The Easter Monday outing proved a great success, a large party walking from Kingswood to Buckland, where an excellent tea was provided. Once on the heath, Mr. Harpur soon dug himself in, and with reflex perched on a three-inch tripod bagged many a foreground study full of that elongated perspective which, owing to a naturalistic view-point, should make an irresistible appeal to any centipede or other ground insect with artistic perception. Mr. Johnson early in the day smashed his focussing screen, and went out of action with most of his plates undamaged. So did another member, owing to his "Compound" shutter refusing to work at any other speed than 1-250th sec. Mr. Walker's auspicious disaster for the day fully maintained his reputation, for the mirror of

his up-to-date reflex insisted on executing a lunatic jazz step on every attempt to operate the shutter release. The Rev. Le Warne must be credited with identifying at a distance of over a mile a hostelry known to exist, but up to then undetected by anxious eyes. "A far, far better thing," etc.

The following Wednesday, Mr. Cavendish Morton gave a lecture on "Discrimination," a subject of immense scope, as was fully admitted. Possessed of real oratorical gifts and a keen analytical faculty, which an emotional method of delivery emphasised in the sense that it compelled attention, the electrical atmosphere created is most difficult to describe, but may be suggested as being in the nature of "complex variations on a theme." Strictly modern in treatment, crashing chords broke in on *pianissimo*, and, amidst general harmonies, fresh *motif* followed on *motif* in somewhat bewildering fashion. Or, expressed in another way—"denunciation" followed so quickly on "appreciation," pathos on humour, sorrow on joy, as to induce a sort of mental switchback condition, with the peculiar feeling of exhilaration such engenders.

The lecture, which was crammed full of good things, including elegant aphorisms and neat definitions, was delivered without even headings to refer to. Meticulous accuracy is therefore not guaranteed in the following notes. All problems, artistic, social, moral, and scientific, were approached on the *dynamic* side: that was insisted upon, and no one raised an objection. Many a definition of "Art," he said, existed, the best one, in his opinion, being: "the seizing of the living truth in the natural, and the finding it still alive in the artificial." Here a member, who has shown signs of mental strain owing to a surfeit of words on the subject during the session, was distinctly heard to say, "Damn art!" "I hope I am not interrupting you," politely said the lecturer. "Not at all," was the equally urbane reply.

Wisdom, Mr. Cavendish Morton continued, can often be found in babes and sucklings, and gave a pleasing illustration in the person of a little son who is evidently a chip of the old block. After a consideration of the theory of "vital activity," the labour troubles were dealt with, the unrest, he thought, being mainly due to "stultified aspirations." Cinematographs came next, which, he deeply regretted, were often misused. Still on the dynamic aspect, the wonderful skill of Inman and Paganini were alluded to, and the psychology of composer and artist were analysed, with his friend the late Coleridge Taylor and Turner as examples. Personally, he considered himself a malignant failure as a professional photographer by attempting to combine a hobby with business. The only satisfied soul in the world was the tinker, a statement which obviously overlooked many an artist of the camera. Dynamics changed to the thunder of dynamite when he turned to "jazz," generated by the worst types of American criminals, and it was appalling that victory should be celebrated in such an abominable way.

Let it be known once and for all, for so it was said, that the creation of fashions in women's dress is spontaneous, born of a desire by the sex to express itself in clothing. Clothing is good so far as it reveals character and movements of the figure, and bad so far as it conceals them, a definition which should cheer the lady revue artist. He then introduced what was apparently the Greek "Doric dress," a square of fine cloth with marginal design, and showed its many graceful applications. When made of thin material it was often employed held up as a background to set off the figure (other clothes were worn). Clothed in the garment, Mr. Cavendish Morton recited in impressive and dramatic manner some lines from Keats' exquisite "Ode to Melancholy," with appropriate variations of posture and the folds of the costume. And so ended the most sensational evening since the secretary, in a state of semi-nudity, gave his demonstration on "physical exercises." One appealed to the mind, the other to the body. A most hearty vote of thanks was accorded for a lecture of exceptional interest, stage-managed in first-class style by an experienced hand—one who now, happily for the club, becomes a new member.

FORTHCOMING EXHIBITIONS.

April 17 to May 22.—Hammersmith Hampshire House Photographic Society Annual Exhibition. Two open classes. Joint secretaries, J. G. Abrahams, 41, Hamilton Terrace, London, N.W.8; A. H. Page, 12, Lime Grove, London, W.12.

Commercial & Legal Intelligence.

Legal Notices.—Notice is given of the dissolution of the partnership (by mutual consent) between Sydney Harold Leveton and Alchanan Cohen, carrying on business as photographic apparatus makers, at 78, Digbeth, Birmingham, under the style of Cohen and Leveton.

NEW COMPANIES.

Nash, Kenyon and Co., Ltd.—This private company was registered on April 19 with a capital of £3,000 in £1 shares. Objects: To take over the photographic department of J. R. Cave, Ltd., formerly carried on by that company and more recently by J. Wilson, at 169, Lord Street, Southport. The first directors are: J. Wilson, 9, Harrod Drive, Southport, gentleman; H. Nash, 141, Sussex Road, Southport, photographer, etc.; H. Kenyon, 46, Sussex Road, Southport, photographer. Registered office: 169, Lord Street, Southport.

News and Notes.

Messrs. A. C. Grundy and Sons, trade printers, advise us that they have removed from Rickmansworth to 12, Grand Parade, St. Leonards-on-Sea.

The Photographic Convention.—It was decided at a council meeting held at Anderton's Hotel, London, E.C., on the 24th ult., to hold a meeting of the Photographic Convention of the United Kingdom this year. The date fixed is the week commencing July 7. It being impossible for the gathering to take place in France, as was intended, the Continental Convention is postponed, and efforts are to be made to make either Oxford or Warwick the centre for the 1919 meeting. Members will be informed by post and announcements made in the Press as soon as the necessary arrangements have been made. Cambridge was also named, but the voting was in favour of the "Dark Blues."

Death of a Noted Australian Photographer.—Australian newspapers just to hand announce the death of one of the best known photographers in the Commonwealth—namely, W. H. Hammer, who died a few weeks ago at Norwood, South Australia. He was the principal of the old-established firm of Hammer and Co., and partner and director of Studio, Ltd. Born at St. Austell, in Cornwall, seventy-four years ago, he went out to Australia in the year 1880, started a photographic business in Adelaide, and was most successful. His great hobby was music, and the Australian papers state that before leaving England he was known throughout Cornwall as an organist and conductor of choirs and bands.

The Photographic Arm.—An official synopsis of the work of the Air Force in the war gives the following particulars of the great work of the photographic section:—

The original and, at first, the only duty of the aeroplane in war was reconnaissance, and the earliest reconnaissance reports were of the utmost value. The information gained immediately prior to and during the retreat from Mons in 1914 was of the greatest possible assistance to the British and French Armies. The effect of regular, rapid, and accurate reconnaissance at once made itself apparent.

With the development of trench warfare it became necessary to supplement reconnaissance reports by full information as to the position of enemy trenches and the location of his batteries. In November, 1914, the first successful aerial photograph was taken of the village of Neuve Chapelle. During the early experimental stages, photographs were taken at an altitude of 3,000 feet, but the rapid development of anti-aircraft fire has forced the aerial photographer to an altitude of 22,000 feet.

During the first month that the photographic section operated in France only 40 negatives were taken. During October, 1918, 23,247 negatives were exposed, and approximately 650,000 prints were issued. A high standard of photographic work has been reached, and whole areas of country, lines of railway, and trench systems have been photographed and accurate maps prepared.

The photographic section in 1914 consisted of two officers and three other ranks. Their outfit comprised two cameras and a port-

able box of developing chemicals. The photographic *personnel* at the present day consists of 250 officers and 3,000 other ranks, distributed throughout all theatres in which photographic work is carried out, and a large training school of photography has been formed at Farnborough. Up to September of this year as many as 5,287,826 prints of aerial photographs had been issued by the Air Service in the field.

Correspondence.

. *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

. *We do not undertake responsibility for the opinions expressed by our correspondents.*

THE FIXING OF BROMIDE PRINTS.

To the Editors.

Gentlemen,—In reference to the three different articles that appeared in your issue of April 18 dealing with this subject, my experience is this (and I print many thousands annually):—I print strips of six. I never put more than two strips in the developer at once. When development is complete the strip is taken in the fingers by each end, and with a curving sweep is quickly passed through a dish of cold water, and immediately placed in the fixing-bath, face up. The dish is then rocked once or twice to wash off any of the developer which may still be left. Then the strip is turned face down. In my opinion the small black spots which are sometimes left on prints are caused, not by air-bells, but by small quantities of developer left on. I find that three heaped tablespoonsful of hypo—which will weigh about 4 ozs.—will fix thirty-six six-postcard sheets without any danger of staining the cards. I do not measure the water; just use sufficient to cover the cards. After this quantity of strips has been passed through, two or three more spoonfuls are added to the bath. Working on this plan, I have very few stained prints.

THOS. HENDERSON.

THE LATE SIR WILLIAM CROOKES

To the Editors

Gentlemen,—Having been intimately associated with the late Sir William Crookes for a great number of years and published several papers with him on a variety of photographic subjects, commencing with early attempts to preserve the sensitiveness of collodion plates (1854), I read with interest your brief notice appearing at page 189 of April 11 issue.

I well remember our portraits being taken together by Messrs. Hennemann and Malone, copy of which you reproduce. This was taken in their studio occupying the upper premises of John Newman, optician, of Regent Street. Crookes and I were fellow students then at the Royal College of Chemistry, and later both were promoted to become Dr. Hofmann's assistants in the general laboratory at Oxford Street. Our moist films were quickly superseded by Dr. Hill Norris's collodio-bromide process, which came to stay.

Crookes and I took a wonderful series of solar eclipse photographs in March, 1854, and July, 1860, through an improvised camera attached to the Woolwich telescope, before this work was regularly undertaken by Glaisher at the Greenwich Observatory.

To get material for his examination of thallium it was necessary to distil considerable quantities of a special brand of Spanish pyrites, and a furnace was set up at Brook Green, Hammersmith (the family residence), and worked continuously, I taking part with him in the night watch. On another occasion we were at work on selenium and the seleno-cyanides—results published in the "Quarterly Journal of the Chemical Society." In fact, so intimately were we associated that I was "best man" at his wedding, which took place at St. Pancras Church on April 10, 1856.—Yours very truly,

Camonbury, April 29. JOHN SPILLER.

PRESS v. PROFESSIONAL PHOTOGRAPHERS.

To the Editors.

Gentlemen,—In the current issue of a weekly journal published in the interests of the workers in the newspaper world is a paragraph which concerns the welfare and social standing of the average professional photographer, and as few of your readers may see it, I beg to call particular attention to it, as well as to the editorial comment that foots it.

The paragraph in question reads thus: "A problem that is becoming increasingly insistent for newspaper photographers is the clashing with professional photographers at public functions. The latter frequently come by appointment, and, in effect, monopolise the subject." This is apparently a contributed paragraph, and the complaint of an enterprising pressman who has struck trouble, as at the foot of the wail appears the following editorial comment: "We do not see why several cameras should not be staged simultaneously. This is done in snapshotting, and could equally be done in a more formal setting."

The editorial comment, I think, evidences a lamentable lack of knowledge of a professional photographer's business, and is apt to encourage the already too precocious newspaper photographer to be a greater nuisance than he sometimes is to-day at happenings to which a legitimate professional worker has been specially invited.

In the case of a special invitation, *i.e.*, "by appointment," I have an idea that the invited photographer has a perfect right to "monopolise" the subject, and I for one shall continue to do so in spite of any interlopers who are present without being invited.

I am looked upon as being a harmless kind of individual, but should any chance press photographer "stage" his camera alongside mine, in front of a group of my own posing, when he has been requested by me not to do so, there will be trouble.

If no special invitation has been given me or anyone else, I am willing to take my chance with the rest and to get what I can as "a sport," but a newspaper photographer has, in my humble opinion, no right to make an exposure upon any group I have been "appointed" to pose. So let us have fair play.—Yours truly,

L. T. W.

NEW SIZES OF SMALL CAMERAS AND PLATES THEREFOR.

To the Editors.

Gentlemen,—The announcement "Quarter-plates to Go," in your issue of 25th ult. will bring home to photographers with more force than ever the fact that they are gradually, but surely, coming under the complete domination of the plate trust, unless indeed this last arbitrary and indefensible action is but a subtle move on the part of the British Photographic Manufacturers' Association to increase the sale of new apparatus by what amounts to the compulsory scrapping of everything essential to the quarter-plate size. The quarter-plate is as much a standard British size as the whole-plate, as it is actually a quarter of a whole-plate, whereas the so-called half-plate belies its name. Presumably, however, it is not proposed to abolish the two last-named sizes for fear of the profession being at last goaded into starting a co-operative plate factory.

Notwithstanding the numerous "toy" sizes introduced with but little reason during the past few years, the quarter-plate undoubtedly remains the favourite amateur size in this country. There must be hundreds of thousands of quarter-plate cameras in existence, a large proportion being of high-class make and good for long years of wear. In addition, there are countless slides, printing frames, dishes, racks, etc., that will be rendered useless by this last step of the plate makers, and it must also not be forgotten that hardly any quarter-plate enlargers will take the proposed new size, 8 by 12 cm. (roughly, 3¼ in. by 4¾ in.)

It is difficult to understand how the abolition of the quarter-plate will prevent waste of material, as I was told some years ago by the manager of a dry-plate works that it was the trade custom to coat whole-plate glass and cut it into four. He also said the "toy" sizes then coming into vogue were welcomed as using up what would otherwise be waste glass. It would probably be impossible to find a parallel in the history of any other industry whereby apparatus representing an enormous aggregate value has been condemned to the scrap-heap by such ruthless action and on such flimsy pretext.—Yours faithfully,

OLD HAND.

Answers to Correspondents.

SPECIAL NOTICE.

In consequence of general reduced supplies of paper, as the result of prohibition of the importation of much wood pulp and grass, a smaller space will be available until further notice for replies to correspondents.

Moreover, we will answer by post if stamped and addressed envelope is enclosed for reply: 5-cent. International Coupon, from readers abroad.

The full questions and answers will be printed only in the case of inquiries of general interest.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

W. F.—If you cannot remove the brown substance by very gently rubbing the lens with a bit of soft old cambric wetted with pure alcohol (spirits of wine), we think it would be necessary for you to send it to an optical firm. No doubt one or other of the lens makers could now undertake such a little job as this.

R. W. C.—If you do not carry on the business in your own name, you are required by the Business Names Act to register it at the cost of 5s. per annum, and to comply with the regulations affecting such registered businesses. The forms should be obtainable from every post office; if not, from the Registrar of Business Names, 59, Russell Square, London, W.C.

A. E.—The smallest size in which a reflex camera is made, apart from a small exceptional pattern of Kodak reflex (not now, we believe, on the market), is 3½ by 2½ inches. The "Soho" of this size measures 6¼ by 6½ by 6 inches when closed. We believe Messrs. Adams and Messrs. Newman and Guardia also make a reflex of this size; probably that of the former would be a little smaller, and that of the latter a little larger, than these dimensions just given.

B. J. K.—The minimum fee for reproduction is 10s. 6d., from which the agents would deduct their commission, but we should think they would be able to place the photographs more successfully than you could by offering them direct to the newspapers. Glossy bromide prints are generally used for Press photographs, and we should say are preferable nowadays to toned P.O.P. We think it very unlikely that you would be able to dispose of the negatives for lecture or other purposes.

A. C.—(1) Ordinary plate glass or heavy window glass is generally used for glazing postcards. The size varies considerably, but for work on a large scale sheets about 3 feet by 18 inches are very commonly used. (2) About the only possible substitute for metol for the development of prints and postcards is amidol, made up according to the usual formula. (3) Ox-gall is one of the very best glazing solutions, and if purchased in the purified form, sold by Messrs. Rheinlander and Sons, New Malden, Surrey, is most effective in use.

J. M.—Metol skin poisoning is a very individual complaint, with the result that what is a remedy for one person is useless for another. The first thing is that anyone afflicted with this complaint should discontinue the use of the developer, and, apart from developing the general health, should take steps to keep the skin in a soft and, we think, slightly acid condition. Ointments which have been very well spoken of for this particular complaint are those known as Ujah and sold by the Ujah Ointment Company, Clarendon Street, Oxford, and as Sphagnol, sold by Peat Products, Ltd., 18/19, Queenhithe, E.C.4.

A. L.—These sensitive buttons are almost entirely imported from America, and are included among the photographic goods, importation of which is prohibited. If you cannot obtain them from Messrs. Fallowfield, we are afraid you will have to regard them as unobtainable. A developing formula is as follows:—

Soda Sulphite, cryst.	31	parts.
Hypo	248	,,
Soda carbonate, cryst.	8	,,
Potass. bromide	8	,,
Water	800	,,
Hydroquinone	20	,,
Ammonia (sp. gr. .91)	45	,,

J. H.—There is almost certainly copyright (the property of someone) in the Royal group, and probably also in that of Disraeli's cabinet, for the reason, in the latter case, that such engravings are almost always made from a painting, and copyright in the latter originally lasted for the life of the artist and seven years after his death, and is further perpetuated by the Act which came into force in 1912. Thus, even though you may not copy the original, you are infringing copyright in it by copying the engraving. You do not say what you propose doing with the copies. If only one or two copies are made, say, for a lecture, any use of this kind is permissible under the new Act, but if copies are to be issued and sold in numbers we think that you render yourself liable for action if the thing comes under the notice of the owners of the rights in the works.

J. K.—(1) So far as we know there is no Customs duty, but we understand that there certainly is at present a restriction on importation. We believe the matter is being taken up by the company, and you had better apply to them for information as to whether they can still export the apparatus. (2) We have not the means of judging what view the Ministry of Labour Committees take as to what is and what is not a retail business, but we should imagine that trade retouching would not be considered such, nor, we should think, would the making of views or commercial photographs. But in the case of a sticky-back business we should imagine that certainly would be regarded as a retail business. Impossible for us to say how long the restrictions will be maintained. From the fact that they have recently been reorganised within the Ministry of Labour, we should imagine that the intention is to keep them in operation for at any rate some time.

The British Journal of Photography.

Line Advertisements.

Charges for Insertion.

Since advertisements cannot be inserted until fully and correctly prepaid, senders of line announcements are asked to bear in mind the scale of charges. They will thus save themselves delay in the publication of their announcements. A Schedule by which an advertisement can be correctly priced will be sent on request.

Net Prepaid Line Advertisements.

12 words or less 1/-
Extra words ... ... 1d. per word.
(No reduction for a series.)

Special Note. Box Number Advertisements.

"Box No." and office address ... ... charged as 6 words.
For forwarding replies add ... 6d. per insertion for each adv't.
If replies are called for this latter charge is not made.

Advertisements cannot be inserted until fully and correctly prepaid.

Orders to repeat an advertisement must be accompanied by the advertisement as previously printed.

Advertisements are not accepted over the telephone or by telegram.

The latest time for receiving small line advertisements is 12 o'clock (noon) on Wednesdays for the current week's issue.

Displayed Adv'ts should reach the Publishers on Monday morning.

The insertion of an Advertisement in any definite issue cannot be guaranteed.

HENRY GREENWOOD & CO., Ltd., Publishers,
24, Wellington Street, Strand, LONDON, W.C. 2.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3079. Vol. LXVI. FRIDAY, MAY 9, 1919. Price Twopence.

Contents.

	Page
Ex-Cathedra	241
Licences for New Retail Business	242
The Development of British Lenses for Aircraft Photography	243
Practicus in the Studio. By Practicus	247
True-to-Nature Photographs. By Harvey Collingridge, B.Sc. (Lond.)	249
Forthcoming Exhibitions	249
Time Developments with Monomet-Hydroquinone	250
Measurements of Plate-Sensitiveness to X-Rays	250
Kodak (Australasia), Ltd	250
Assistants' Notes	251
Photo-Mechanical Notes	252
Patent News	252
Meetings of Societies	253
Commercial and Legal Intelligence	254
News and Notes	254
Correspondence—	
Reproduction Free for Press Photographs	254
Sensitive Ferrotype Button Plates	255
Press v. Professional Photographers	255
The New Standard Plate Sizes	255
Answers to Correspondents	255

SUMMARY.

The papers contributed to a recent meeting of the Royal Photographic Society as a symposium of progress in the production of lenses for aerial photography represented the achievements in this field of Messrs. Taylor, Taylor and Hobson, Ross, Limited, and Aldis Brothers. Mr. Appleton, for the first-named firm, deals with the measures taken for the design of a lens of greatly reduced comatical error and yielding the crisp and "relief" definition required in aerial negatives. Mr. Hasselkus, of Ross, Limited, describes modifications made in the Ross Xpres for aerial work, as also a new and ample type of f/6 aerial lens. (P. 243.)

A note by Mr. Harvey Collingridge, B.Sc., deals with the optical conditions in true-to-nature photography, and contains a chart designed to indicate what they are in a given case (P. 249.)

A system of measurement of sensitiveness of plates to X-rays is contained in a recent paper before the Royal Society of Victoria. (P. 250.)

In "Photo-Mechanical Notes" (which we hope now to publish again at frequent intervals) the writer deals with the storage of films, stripped from wet-collodion negatives, with repeat orders for engravings and with rotary photogravure from flat plates. (P. 252.)

The use of a lens of long focus in the photographing of motor-cars is a necessary means of avoiding exaggerated size of the bonnet and corresponding dwarfing of the body. (P. 242.)

Formulæ for time development with Monomet-hydroquinone are published by the White Band Manufacturing Company. (P. 250.)

In his article this week "Practicus" deals with the commercial considerations concerned in the sale of enlargements in a portrait business, pointing out the necessity for superiority of quality and the opportunities for the sale of costly enlargements which are presented to even a middle-class business. (P. 247.)

The Order, under the Defence of the Realm Act, requiring a licence for the starting of a new retail business is still in force, and likely to continue so for some time. Some notes for the guidance of those applying for licences will be found on page 242.

A contributor to "Assistants' Notes" gives tables, showing the wastage in enlarging negatives of the present standard sizes on to papers of sizes ranging from half-plate to 20 by 16. (P. 251.)

Sydney papers have recently published figures showing the continuous prosperity of the Kodak (Australasia) Company. (P. 250.)

An apparatus trimming both edges at once of a photograph or mount is among the patents of the week. (P. 252.)

As a system of producing portrait prints the enlargement of small negatives made on the rapid portrait plate can be overdone. (P. 242.)

EX CATHEDRA.

Colonial and Foreign. In referring briefly last week to the issue of June 6 next of the special Colonial and Foreign number of the "British Journal" we laid emphasis upon the particular feature of its distribution, in an extra edition of 5,000 copies, throughout the British Empire abroad and in foreign countries. These direct recipients of the issue have their names and addresses filed at this office in a list which is scrupulously corrected and revised from year to year in correspondence with changes which are notified to us directly by the people concerned or through the copies being returned by the Post Office. The list is thus an up-to-date one, and practically every copy of the extra edition reaches its addressee. Of the foreign countries to which copies are sent the following are of special interest at the present time:—

Argentina	Jamaica
Brazil	Japan
Burma	Mexico
China	Malay Peninsula
Colombia	Peru
Dutch East Indies	United States
Egypt	Uruguay
Guatemala	Venezuela

It would seem that the forthcoming "B.J. Special" will contain a heavy weight of announcements from advertisers who, since the outbreak of war, have been able by means of its predecessors to keep their names before consumers in these countries whilst enemy competitors have been cut off from their European sources of supply. With the removal of restrictions on trade it cannot be doubted that British firms will claim a large share of custom which has accumulated during these years, and are taking this first opportunity of announcing their peace-time resources to the foreign buyer. The forthcoming special issue will likewise carry the messages of British manufacturing and exporting houses to the widely separated places of the British Empire. There is scarcely a corner of Africa to which copies are not sent, and they go in particular to Cape Colony, the Orange River Colony, Rhodesia, Natal, and the Transvaal. Australasia receives a considerable proportion, the lists of recipients being classified under New South Wales, Queensland, South Australia, Victoria, Western Australia, Tasmania, and New Zealand, whilst there is even a sprinkling in the Sandwich, Fiji, and other Pacific Island groups. British North America figures prominently in these lists, which mark the regularly increasing establishment of portrait and commercial photographers in Quebec, New Brunswick, Nova Scotia, and Newfoundland, Ontario, Alberta, and Manitoba, and British Columbia. And when we have mentioned the Indian Empire there still remain a host of far-off minor states, islands, and places to the largely isolated photo-

graphic buyers in which the forthcoming issue is sent. Announcement of the last day for the receipt of advertisements will be made in due course, but early intimation of space requirements is advised.

* * *

Sensitising Carbon Tissue. Carbon printing is not so generally used as it might be, on account of the difficulty which some workers find in sensitising the tissue. When ready-sensitised tissue can be obtained this trouble does not arise, but many people find it inconvenient to wait for supplies, and moreover often require only one or two pieces of a special colour. The only course, therefore, is to keep a small assortment of various colours of tissue in stock, and to sensitise as required. This may readily be done with a spirit sensitiser, but we much prefer sensitising in the usual 3 to 5 per cent. bichromate bath, and squeegeeing the tissue upon ferrotype plates to dry. This protects the surface from gas, coke-stove, or other deleterious fumes, and also gives a perfectly flat and polished surface to the gelatine, making it much easier to secure contact with the negative than when the tissue is allowed to dry. The total time necessary for sensitising and squeegeeing a dozen pieces of tissue need not exceed twenty minutes, and after that nothing more is to be done until the tissue is filled into the frames. No special precautions against light are needed while sensitising, but the sheet when on the ferrotype should be kept in as subdued a light as possible. In a warm room they will dry in three or four hours, and then one must take care that if they drop off the ferrotype they are at once transferred to a light-tight box or calcium tube.

* * *

Perspective in Catalogue Photographs. We have been struck by the many catalogue illustrations we see which lose much of their advertising value because of the violent perspective of the photograph, usually due to the quite unnecessary use by the photographer of a lens of too short focus. For example, photographs of motor-cars are nearly always made with a lens that gives a picture showing the bonnet of the engine enormous and a diminutive car body, which latter surely should interest the prospective purchaser most. We quite understand that the manufacturer of the car is apt unconsciously to lay stress on the mechanical features of his car, and therefore he must be expected to insist upon a point of view in which the engine, though covered, is prominent, but at the same time he does not want his picture of a limousine, for instance to look as though it were meant for dwarfs with a giant driver, and the back wheels to look half the size of the front ones. This is the photographer's fault, and he might still retain the same point of view and also give correct perspective if he would only use a longer focus lens and get farther away from the subject. What we say of motor-cars holds true of most other large objects that are photographed for catalogues—furniture, pianos, machinery, and so on.

* * *

Grain and Enlarging. While we have no wish to under-estimate the value of the enlarging process, there is no doubt that many of the results that are seen in professional show cases are decidedly over-enlarged. Many photographers seem to think that if only the definition of the negative is good, there is really no limit to the size of the enlargement that may be made from it. In landscape or similar work perhaps that may be so, but in portrait photography there are limits beyond which the negative will not make an enlargement of good technical quality by reason of the grain of the plate. While improvements in this respect have been many, it is still impossible that a plate of studio rapidity can be as fine grained as one with a speed of perhaps 80 H. and D. Any photographer who doubts the truth of this assertion need only take one of his average portrait negatives and another on a fine-grained slow plate and have an enlargement made from each. We have little doubt which enlargement will be most free from granularity. No matter what many photographic writers may say, the small camera will never for this reason be universally adopted for studio work, for it is almost a literal impossibility to enlarge, say, from $2\frac{1}{4}$ x $1\frac{1}{2}$ to 12 x 10 without the complexion of the sitter having the texture of a stucco wall or concrete floor. Many of our best portraitists still adhere wholly to contact work, and such a course is amply justified by their results. To be well within the limit of freedom from granularity enlargement to not more than two or three diameters may be prescribed as advisable practice, sufficing also for practical and commercial conditions.

LICENCES FOR NEW RETAIL BUSINESSES.

The Order issued in February of last year under the Defence of the Realm Act in reference to the establishment of new retail businesses is one which is still in force, and looks as though it would remain in force for a good time yet. Naturally, as a result of demobilisation, a great many men now find it necessary to comply with the terms of the Order in setting up for themselves in business. Scarcely a day passes but we receive several applications for information as to the course which must be followed. We referred to the terms of the Order some months ago, but since, apparently, it is only until quite recently that advice in regard to it is being widely sought, we may advisedly deal with it again. It should be understood at the outset that at the time of its issue, and still more at the present time, the Order was and is designed for the protection of men who have been compelled through their joining the Services to close down their own businesses—retail businesses, that is, in which the dealings are with the general public. The Order does not apply to businesses in which the customers are "trade"—that is to say, businesses in which the goods are sold to, or work done for, persons in a particular trade. The object of the Order is to prevent persons stepping into the shoes of men who have voluntarily or compulsorily closed their businesses, and therefore those who have done so and are now making application for licence to revive a business which has been discontinued or to open elsewhere should make it clear that their service with the Army or Navy has necessitated this course.

The Order applies not only to the establishment of a new retail business, but also to the addition, to an existing retail trade or business, of a new branch. Such a provision is a very necessary one for the prevention of evasion of the terms of the Order. Nevertheless, it is also one which at times may bear hardly upon a genuine applicant. For example, a man who has been demobilised wishes to obtain a licence for the establishment of a photographer's business, and may wish also to add to the latter that of making and supply of picture frames. A purely official department very likely may raise an objection, but we think that an applicant should have no difficulty in showing that such a side line, even if it was not part of the business which he formerly carried on, is so commonly a part of an ordinary photographer's business that it cannot be regarded as the addition of a distinct branch of trade.

Originally under the administration of the Ministry of National Service, the Order has now passed to the Ministry of Labour, and is in the hands of eleven offices distri-

buted, ten of them in England, one in Wales, and one in Scotland. The Order apparently does not apply to Ireland; if it does, at any rate we have no knowledge of its administration there. Therefore, any applicant who is starting or re-starting a retail business requires to address the office covering the district in which the business will be situated. The address of the applicant is of no concern in this respect, since the function of the office is to carry out investigation by its staff of the conditions in the town or quarter where the business is to be established, and therefore the application requires to be made to the office most accessible. The addresses of these licensing offices are given below. Inquiries should be made in writing to the Secretary (New Business Licences).

London and South-Eastern (City and Metropolitan Police District, Kent, Surrey, Sussex).—Hotel Windsor, Victoria Street, London, S.W.1.

South-Western (Gloucester, Wilts, Dorset, Somerset, Devon, Cornwall, Hants, Isle of Wight).—5A, Union Street, Bristol.

Yorks and East Midlands (Notts, Yorks (excluding Cleveland), Derby (excluding Glossop and New Mills), Lincoln).—Harewood Barracks, Woodhouse Lane, Leeds.

West Midlands (Staffs, Shropshire, Hereford, Worcester, Warwick).—Queen's College, Paradise Street, Birmingham.

South Midlands and Eastern (Norfolk, Suffolk, Cambridge, Oxford, Huntingdon, Bedford, Berks, Bucks, Northants, Leicestershire, Rutland, Herts, Essex).—80, Westbourne Terrace, Paddington.

North-Western (Lancashire, Cheshire, Derbyshire (Glossop and New Mills District), Isle of Man).—New Arts Buildings, Liverpool.

Northern (Northumberland, Durham, Cumberland, Westmorland, Yorkshire (Cleveland District).—47, Pilgrim Street, Newcastle-on-Tyne.

Wales (all Wales and Monmouthshire).—27, Bute Street, Cardiff. Scotland (all Scotland).—15, Athol Crescent, Edinburgh.

A good deal of disappointment is quite naturally felt at the length of time which elapses before the licence is granted, but the Ministry of Labour has recently sought to justify the slowness of the process by stating that applications are being received to the number of about 2,500 per week, of which about 2,000 are granted. Probably the apology has its justification in fact. It can be readily understood that if anything like an adequate investigation is made of each of the 200 odd applications at each of the eleven branches, for this alone time is bound to be taken up, apart from the reference of the cases back for the decision of the Advisory Committees which recommend the granting or refusal of the applications.

THE DEVELOPMENT OF BRITISH LENSES FOR AIRCRAFT PHOTOGRAPHY.

[The meeting of the Royal Photographic Society held a month or two ago provided a very notable demonstration of the achievements of British lens makers in the production of objectives answering to the very critical requirements in the way of definition and brilliancy of the R.A.F. Photographic Section. The papers which we reprint from the Society's "Journal," usefully emphasize the success which attended the efforts of British opticians, a success the more remarkable when the handicapping conditions, the chief of which was the restricted variety of optical glasses, are recognised. Unfortunately, half-tone reproduction on news paper does not suffice to show the really very marked superiority in definition and covering power of these British lenses in comparison with those of enemy manufacture of equal focal length. But the technical information given by the representative of the three optical firms which contributed to the meeting will be read with interest. The three firms represented are Messrs. Taylor, Taylor, and Hobson (Mr. W. B. Appleton), Messrs. Ross, Limited (Mr. J. Hasselkus), and Messrs. Aldis Brothers (authorship of the paper not stated).—Eds. "B. J."]

Judging from letters which have appeared recently in the photographic journals, there is a general desire among dealers in, and users of, photographic lenses, that the merits of lenses of British make should be clearly placed before the public, and I hope that the information given by me and others will serve that purpose. As one who has a great admiration for beautiful work, I do not under-estimate the excellence, both in design and execution, of the best lenses of German manufacture, but I hope the facts and comparisons which I shall presently give will make it abundantly clear that there is no longer any excuse for the public to buy German lenses in the belief that they are the best.

It may interest members to hear fuller particulars than were given in last year's Presidential address, of how my firm's lenses were brought into such close competition with the celebrated Ic. Tessar. It may be remembered that when there was a shortage of lenses suitable for the Air Service, a public appeal was made for certain lenses of specified focus and aperture, which were known to be suitable for Service requirements. At that time Taylor, Taylor, and Hobson, Ltd., had already supplied the Service with large quantities of Cooke lenses, and were rather surprised that these were not asked for in the advertisement. Upon expressing their disappointment to the late Mr. A. S. Esslemont, one of the directors of Optical Munitions Supply, he undertook to invite all who were closely interested, both in the R.F.C. and R.N.A.S., to meet me in his office in order that we might learn in what way one lens was thought to be better than another for aerial work. This was a most useful conference, for, although it was not then known why some lenses gave better results than others, the authorities were able to state the particular characteristics required in their negatives. These were wanted with as much contrast, and what was described as "relief effect" as possible, combined with very crisp definition throughout the whole field. These conditions were at that time to be produced by lenses of 8¼-in. and 10½-in. focus at $f/4.5$ aperture on 5 by 4 plates. These results had appeared to be most frequently and easily obtained when using Ic. Tessar lenses, and we were challenged to produce a lens at least equal to, and, if possible, better than, this. We accepted the challenge, and every facility was given to have proper tests made. And here I desire to urge that in all new problems of this kind the optician should first be consulted and given the fullest knowledge of the requirements. With this information before us it was not long before we were able to submit our Aviar lens for trial.

When the lens was ready a stereo camera was provided by the R.N.A.S., an 8¼-in. Tessar was fitted on one side, and our Aviar lens of similar aperture and focus on the other, and photographs were taken from an aeroplane with this apparatus at Farnborough. These proved to be very satisfactory, and

as our ex-President, Mr. J. H. Gear, stated last year, when he was asked to adjudicate upon the results, he had no hesitation in giving preference to the picture taken with the Aviar lens.

Now the task I have undertaken is that of explaining what improvement we were able to make in our lens to secure this result; but before proceeding I wish it to be clearly understood that in doing so I do not seek to belittle the Tessar, but to demonstrate how, in one direction at least, we have improved upon it.

Before referring to this in detail it is necessary to mention some of the points which have to be considered when designing a lens for a specific purpose. It is easy to construct a lens of small aperture giving good definition throughout a field of narrow angle, because the problems are in the main quite simple problems of chromatic and spherical aberration But as the aperture and angle of field increase, the problem grows disproportionately in complexity because we have to deal simultaneously also with the further factors of astigmatism, coma, and flatness of field.

Therefore, if one requires the very finest definition over any

Fig. 1.

given field (or size of photographic plate), it is necessary in designing the lens to limit one's consideration to that size of field. Hence the importance of knowing the conditions; for, whereas an 8¼-in. lens includes an angle of 20° from the axis on a 5 by 4 plate, a 10½-in. lens only includes an angle of 17° on the same plate. I shall presently show copies of two test photographs to illustrate the difference that can be made in field corrections by slight modifications of the lens.

But although improvement was made by correcting each lens for a specific angle, the more important improvement that I propose to refer to in detail resulted from a careful consideration of the coma corrections. One of our mathematicians, Mr. A. Warmisham, M.Sc., made a special study of this defect, hoping to improve upon the Tessar lens in this respect. This he succeeded in doing in his design of the Aviar lens. This lens is composed of two outside positive and two inside negative single elements, and may be considered as a modified form of Cooke lens, the coma correction of which is referred to in a book by Dr. Hans Harting, who says:—"Of the greatest importance is the good correction for coma . . . which corresponds to an equally good fulfilment of the sine condition. In fact the Cooke lens is the first anastigmat which surpassed the anastigmats known at the time of its production in sharpness of definition over the usable angle of view. This was specially true for the series *f*/4.5, the calculation of which must be regarded as an absolutely brilliant achievement, the more so because the constructor had at his disposal to meet the eight conditions for the construction of an anastigmat a very limited number of elements of construction."

I would not convey the impression that perfection in a lens depends entirely upon its freedom from coma, but I hope that the consideration of this important factor will prove of sufficient interest to occupy the time at my disposal, and I will leave those who follow to deal with other defects.

It is probable that most here are familiar with the appearance of coma, but for any who are not I have made a rough diagram illustrating the comet-like shape that is produced by this defect upon small pencils of light which pass through a lens obliquely to its axis. (Fig. 1.)

Although coma is referred to as a separate defect, it is impossible to isolate it entirely from the kindred defects of astigmatism and spherical aberration. However, I will endeavour to do so as far as possible, and for this purpose have had a model made, which I show with apologies.

Imagine this (Figs. 2 and 3) to be a plano-convex lens with

Fig. 2.—Section through primary principal plane.

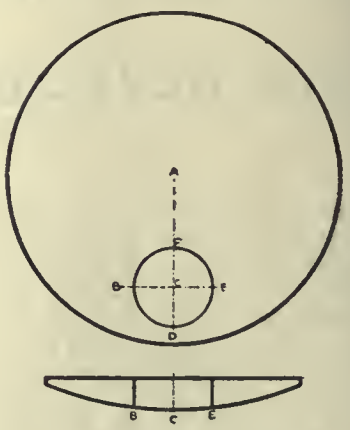


Fig. 3.—Section through secondary principal plane.

its optical axis at A, and that we wish to study the formation of an image of a distant point of light produced by an oblique pencil, or bundle, of rays limited in diameter by the circle at B. The centre ray of this pencil marked C is known as the principal ray, and our object will be to study the refraction of the rays passing through the plane formed by connecting this principal ray with the optical axis, *i.e.*, in the direction DCA, known as the primary or meridional principal plane; and also the rays which lie in the plane BCE, at right angles to DCA, and known as the secondary, equatorial, or saggital principal plane. This model will enable us to see what the section of the lens would be like in these two directions, and if we look at the last-mentioned first we see that the section is symmetrical about the principal ray, and therefore, whatever the result produced by the rays in this plane, it will be similar on either side of the principal ray. Now let us examine the section in the meridional plane, and we see that this is quite unsymmetrical on either side of the principal ray, which is, of course, common to the two planes. We should, therefore, expect the image formed in this direction to be unsymmetrical also, and therefore much more likely to cause trouble. If we were to study a section in all the other planes surrounding the principal ray, we should find none beside BCE in which the refraction would be symmetrical, and as

the image is built up of a multitude of rays passing through all these planes, it is easy to imagine that it is of a very complex character and difficult to analyse. While studying the formation of this oblique image it may be well to contrast it with the image of a distant point of light formed on the axis A of the lens. Here, of course, all meridians are the same, and the image is therefore symmetrical and free from coma, as all sections cut through the axis would be alike.

Before considering the subject in a more orthodox way by reference to diagrams, I have ventured to develop my illustration a stage further, and would ask you to imagine this to be the pencil of oblique rays, which we have been studying, converging to a focus.

If we now view the image formed by these rays we find it symmetrical about the principal ray in the second principal plane, but unsymmetrical in the first principal plane, producing the comet-shaped image with a bright nucleus of light and a tail-like fringe known as coma. You will readily understand that the coma at any given angle from the optical axis of the lens is the same in all parts of the field, assuming, of course, that the lens is accurately centred. This will be quite clear if I rotate the model on its axis .

Now to illustrate the same effect by means of diagrams, exaggerated to show this clearly, we will take first the case of rays passing through the lens from left to right which are parallel to the axis AB, and equidistant from it on either side. The rays CD will be refracted equally (Fig. 4), and converge

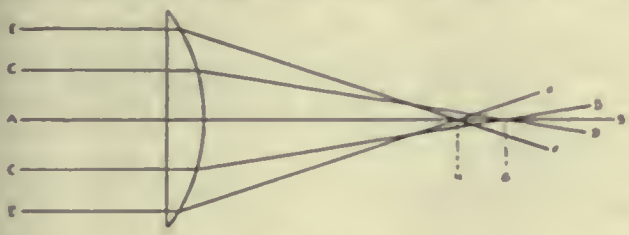


Fig. 4.

to a point G on the axis; similarly, the rays EF will converge to a point on the axis, but they are refracted more than the rays CD, and consequently meet the axis at a point H nearer the lens. It is well known, and I do not wish to spend time upon it, that this is the cause of spherical aberration, and this, so far as it can be dissociated from astigmatism, is what gives rise to any imperfect formation of image by an oblique pencil in the equatorial plane.

The next diagram (Fig. 5) will show the refraction of parallel

Fig. 5.

oblique rays through the meridional plane, in which AB is the principal ray, and it will at once be seen that rays equidistant and on either side of this do not meet upon it, but are differently refracted and produce a caustic curve, which is the cause of coma and the consequent want of crispness in definition where it exists. The intricate oblique image formed by a lens with coma consists of superimposed patterns of these two simple types.

The appearance of this coma will be clearly seen in the next slide (Fig. 6), which will show actual photographs, magnified fifteen times, taken of an image of a small source of light in the focal plane formed by Aviar and Tessar lenses of approximately the same focus and aperture, and under identical conditions.

The first image is that formed in the centre of the field,

Fig. 6.

i.e., on the axis of the lens, the next at an angle of 15 deg. from the axis, and the third at 20 deg. from the axis corresponding to the angle included at the margin of the field.

After what I have already said it will, I hope, be understood that what our lens designer aimed at was to so balance the curves of the Aviar lens as to secure as compact and concentrated an oblique image as possible with the minimum of

Fig. 7.

inequality in the fringe, and I am sure you will have no difficulty in agreeing with me that the set of images marked A produced by the Aviar lens is better in this respect than the set marked T produced by the Tessar.

The difference is also clearly marked in the next slide (Fig. 7), in which the images similarly produced by the same two lenses are focussed as accurately as possible. In this case the oblique images do not lie exactly in the focal plane.

The next slide (Fig. 8) will show the same results given by a normal Cooke lens. The absolute freedom from spherical aberration in the axial image, which, being common to both sets, is only reproduced once, and the really wonderful image at 20 deg. shows how nearly perfect the corrections of this lens

were, but the 15 deg. image indicates where improvement was possible.

Realising that photographs are not quite so convincing as seeing the actual images themselves, I hope to show these shortly, although it is difficult to produce them with sufficient brilliancy to show to so large an audience at once.

The next slide illustrates what I said in the earlier part of

Fig. 8.

my lecture about the importance of knowing the angle of field to be covered by the lens. These two photographs were made with lenses only slightly modified to alter the angle of best definition. In one case the middle zones are sacrificed a little to secure a rather greater angle, but in the other case, where the angle is not required, the definition is proportionately better at the smaller angles, although falling off very quickly beyond.

While the Cooke lens has always had very perfect axial corrections, it has been customary for most Continental makers to sacrifice central definition slightly in order to secure rather more covering power, but Mr. Twyman has recently demonstrated that by judicious figuring even this is no longer necessary, and it is fair to claim that the resolving power of the best photographic lenses has now reached a very high degree of perfection.

By the courtesy and assistance of officers in the lens testing section of the Air Ministry, I am able to show copies of photographs of their test chart, made with 8¼-in. and 10¼-in. *f*/4.5 Aviar lenses.

I have also their test of a 10½in. *f*/6 Aviar lens designed to cover a 9 ins. by 7 ins. plate; and although from what I have said it will be understood that I do not consider comparisons between lenses quite fair unless they are designed for the same purpose, yet from the appearance of the next slide, made with a Goerz Dagor lens of approximately the same focus and with a slightly smaller aperture, it will be seen that considerable improvement will have to be made in this lens before it approaches the quality of the Aviar.

I have also some comparative test prints made with longer focus lenses which can be examined afterwards; for as time went on lenses of longer and longer focal length were asked for, and finally we made a 36-in. lens of the telephoto type; but subsequent speakers will refer in greater detail to these longer focus lenses.

It was at first sight a little unexpected that simultaneously with the demand for long focus lenses came a request for short focus wide-angle lenses. These were, however, needed for the purpose of securing photographs over a large area in order to study massed formation of troops, etc. That a 4-in. Cooke Primoplane lens should, from an altitude of about 3½ miles, have produced such a clear, crisp image that barbed wire entanglements could be detected in the enlargements is, I think, a gratifying tribute to the quality of a lens of British design and manufacture.

W. B. Appleton.

In the early days of the war we were already supplying lenses for aerial photography, but the conditions to be fulfilled had not been clearly realised by either aerial photographers or by lens makers, and naturally the commercial type of lens was recommended and used then. Although these lens were excellent in their way, they suffered from a correction which had been driven too far—that is to say, the plate which these lenses covered was very much larger than that required for aircraft work, with the result that the edge of the plate came just into the position where the correction for astigmatism is at its worst. Photographers who use anastigmat lenses know that very often the image is better on the margin of the plate than in the intermediate zones between centre and margin. The actual magnitude of the astigmatical aberration at its worse point generally is of the order of 0.5 to 0.6 mm. per 100 mm. focus; in other words, the aberration varies from 0 in the centre and margin of the plate to 0.5 mm. towards the lens in the intermediate zones. This generally applies to the very best anastigmat lenses which are corrected for covering angles of 56 to 58 degrees.

The first lenses supplied to Home and Allied Air Forces were of the commercial *f*/4.5 Xpres type, which were naturally corrected for angles such as we mention, but the results obtained on a 5 by 4 plate with an 8½ or 10 in. lens were not as good as one would in the ordinary way of things expect, and investigation showed that the margin of the plate was just bordering on the region of worst correction. Knowing the excellent elements for correction in our Xpres lens, we felt certain that a modification of this type of lens would solve the problem in a satisfactory way.

We therefore set to work to construct our 8½ in. and 10 in. Airo Xpres, which aimed at the best correction of the image from centre to margin of the 5 by 4 plate. The larger foci, such as 14 in. and 20 in., were for correspondingly larger plates.

The general excellence of the photographs taken with these lenses shows that we have been successful in this. Whereas the commercial Xpres is corrected an angle of 56 deg., the Airo Xpres has been corrected for an angle of 36 deg. only, and conjointly with this the actual astigmatical aberration has been reduced from 0.5 mm. to 0.25 mm. in the intermediate zones of the plate. This shows the great advance over the quality of the image of the commercial Xpres which has been obtained by the special construction of the Airo Xpres suitable for best performance on a small plate. Together with the correction for astigmatism, coma also has had to receive special attention.

The correction for coma, by which term we mean unsymmetrical spherical aberration of oblique pencils, generally becomes progressively worse as the covering angle increases, so that the image formed in the corner of the plate is an image composed of a first-rate astigmatically corrected image and a second-rate comatically corrected one.

The correction for coma has not generally received the attention that is really due to it. It has been frequently stated by noted authors of scientific works, Professor Harting, for example, that lenses that are well corrected for sine condition are free from coma. This contention we have not been able to substantiate; in fact, we believe that it does not hold

good in the case of photographic lenses of great aperture and substantial covering power.

We invariably find the zonal aberration of oblique pencils follows closely the zonal aberration of the central pencils; in other words, we find that a better coma correction can be got with lenses showing small zonal aberration for central pencils. The Airo Xpres is a good example of what can be realised in a lens which has all the elements necessary for the adequate correction of spherical aberration, astigmatism, and coma.

When engaged upon the manufacture of Airo Xpres lenses, the difficulty of glass supply became very acute, and we were asked by the Air Board to construct a lens that could be simply and quickly made of glasses in stock, and capable of reproduction by one of the English optical glass manufacturers. The outcome of this was the Ross *f*/6 Airo lens, a type made of four single lenses, all dissimilar, but two kinds of glass only were employed—a light flint and a dense barium crown. Any mathematician who knows the difficulty of constructing a lens of such aperture and characteristics as specified by the Air Board, particularly when restricted to two types of glass only, will agree that this represents no mean programme.

It is a curious coincidence that the first photographs taken from an aeroplane were taken with a 17-in. *f*/5.4 Ross telecentric lens, and that the last lens we were engaged upon for the Air Board was a 36-in. focus lens with short back focus.

J. HASSELKUS.

(The paper contributed by Messrs. Aldis Bros. will appear next week.—EDS. "B. J.")

PRACTICUS IN THE STUDIO.

[Previous articles of this series, in which the aim of the writer is to communicate items of a long experience in studio portraiture, have appeared weekly since the beginning of the present year. It is not thought possible to continue the series to the length of that by the same writer which ran through the "British Journal" some years ago, but if any reader among the younger generation of photographers, and particularly those engaged as assistants, has a particular subject which might be dealt with, his or her suggestion will be welcomed. The subjects of the previous articles of the series have been as follows:—

A Talk About Lighting (Jan. 3).
The Camera and the Lens (Jan. 10).
Managing the Sitter (Jan. 17).
Backgrounds (Jan. 24).
Studio Exposures (Jan. 31).
Artificial Lighting (Feb. 7).
Printing Processes for Portraiture (Feb. 14).
Studio Accessories and Furniture (Feb. 21).
The Surroundings of the Studio (Feb. 28).
Studio Heating and Ventilation (March 7).
The Postcard Studio (March 14).
The Printing-Room (March 21).
About the Reception Room (March 28).
Home Portraiture (April 4).
Portable Studios (April 11).
Copying (April 18).
Handling the Studio Camera (April 25).
More About Lenses (May 2).

ENLARGEMENTS.

I HAVE always felt that the majority of portrait photographers do not realise what an important branch of business may be made of selling enlargements if it is properly handled. Many of the present generation of receptionists do not seem to make any attempt in this direction, although there is often every opportunity of doing so, possibly because their attention has never been drawn to it, and partly perhaps for the lack of specimens of sufficiently attractive character. In most studios the specimens on show are more or less old-fashioned in style, and even if comparatively new are commonplace in style, resembling those which can be obtained from the cheap houses which specialise in this sort of thing. Some years ago photographers were troubled by a person named Tanqueray, who advertised free enlargements, afterwards demanding the sum, if I remember rightly, of 10 francs for packing and postage; but his activities here have long since ceased, and the legitimate trader has again the field to himself. The point is to offer something distinctive in character, so that it cannot be compared with work offered at a cheap rate. Most of the cheap enlargements are not of a quality which renders them fit to hang in a well-furnished house, and it should be the aim of the photographer to avoid this fault and to produce work that will not clash with such works of art as his patrons may already possess.

In my opinion every enlargement should be sent out framed appropriately, so that the work is not spoiled by unsuitable setting, and then one will not have such an experience as seeing a large red carbon vignette surrounded with three inches of crimson plush, which was once the fate of one of my own prints. It is, of course, wrong to force any particular style of frame or mount upon a patron, but if an intelligent interest is taken in his wants it is generally quite easy to produce something which is satisfactory both to photographer and customer. Moreover, it gives the impression that the former knows his business, and prepares a favourable reception in advance. For instance, I always inquire where the enlargement is to hang—whether upon a light or dark wall, and the nature of any other pictures which are to be placed near it. This will often give the opportunity to suggest a more costly picture than the customer contemplated at first, which is all the better if he agrees. It is a little more trouble than showing the ordinary vignette on a light mount framed in two-inch oak, but it is worth doing, and if the customer does not bite there is always the "usual thing" to fall back upon. Many years ago Mr. Sarony adopted the plan of showing every likely sitter a transparency from one of his poses projected in the enlarging lantern, so that he could see what a fine picture it would make, and the financial results of this proceeding are said to have been eminently satisfactory. Most would not care to go to this length, but I mention it to show that it pays to take a little trouble to get a good order.

Besides the orthodox black and white or sepia vignette, there is a wide variety of styles in finishing, and it is well to be provided with a good range of specimens. Life-sized heads in monochrome framed close up are good sellers, as are those finished upon a tinted ground in imitation of crayon portraits. Good water-colour finish, or, what is easier and cheaper to produce, transparent oil colour, is also very attractive, while a solid oil finish, or even a painting upon canvas without photo-basis, will appeal to more people than most photographers would imagine. There are some firms who make a specialty of doing the latter class of picture from any photograph, and it would surely be better for the man who takes the original negative to have all that can be made out of it. There are plenty of good trade firms who will turn out first-class work, and artists who will paint direct at very reasonable rates, so

that there is no difficulty on that score. Few photographers have the time or facilities for doing the best class of work at home, and therefore often let opportunities pass by, supplying a two-guinea picture which they can make instead of a twenty-guinea one which could be put out. Even if the two guineas are nearly all profit it does not compare with what might be made out of the better class work. There are many West End firms who know what people are prepared to pay for a picture, but there are many more skilled photographers with a good class clientèle who are afraid to bring forward high-priced work. In what I may call a good middle-class business with which I was connected some years ago, enlargements and paintings were run on the lines I have indicated, and it was found quite easy to get a minimum of three guineas for 12 x 10, with prices ranging up to twenty-five and even fifty pounds for larger work, and this was at a time when three guineas a dozen was the top price for cabinets.

Naturally, for these prices permanency was guaranteed, and all the best work was upon a carbon or platinum; while bromide prints were always treated with a protective coating of wax to prevent the tarnishing of the image which would otherwise occur. It would be a good thing if bromide opals could again be brought into vogue, as these are naturally more permanent than paper prints, the backing being impermeable, while the surface can be protected. These are good selling points, something to justify the price which is asked.

Although portrait work provides the largest proportion of orders, it is surprising how much can be done in other directions. Horses and dogs are very remunerative lines, the former especially, as the owners are usually well to do, and will often order an oil painting if they find they can get it. I have taken £20 for a painting of a horse, not his own, from a man who has had a good win from it! It is necessary in such cases to avoid copyright troubles, but the owner of the negative will usually grant permission for a moderate fee, particularly if the work is to be painted without basis.

Coming into a different category, but still worthy of notice, are enlargements for commercial purposes, such as motor cars, buildings, silver ware, views for advertisements, and similar subjects. These will have to be made at very moderate prices, but here again quality must not be sacrificed to cheapness. If a man sells motor cars at £500 to £1,000 each, he is not likely to care whether he pays one guinea or two for a print, so long as he gets the best possible result from the subject. He wants either a fine view showing the car prominently or one in which the background is carefully blocked out, cast shadows put in with the air-brush, and all details clearly shown, and the man who will give him this gets the order. It is useless to treat such subjects as if they were amateur snapshots, just a straight print spotted and mounted. Do not think, however, that amateur work is to be despised; an amateur is often willing to pay well for a picture that will save his reputation. I have had one or two nice orders for Bromoils from negatives which were useless for any other process; the amateur got the credit for a work of art, and the photographer the cash.

Although this chat is rather a business than a technical one, a few practical notes will not be out of place. In the first place, especial care must be given to the quality of the negative, and where it is intended to try for enlarging orders all negatives should be made with that point in view. Fortunately a negative which is good for enlarging is good for all other purposes. A rather thin image is usually preferable, but it is not necessary. Full exposure should be given, and development must not be carried too far; all details should be clear in the high-lights as well as in the shadows; there should be no trace of fog, and to this end the dark-room illumination should be carefully tested, and all reflections from camera bellows, lens tube, and other parts of the apparatus eliminated. There should be no trace of yellowness in the film, and for this reason it is desirable to use metol-hydroquinone or Azol instead of pyro, although with proper treatment pyro will give stainless negatives. It must be remembered that a patch of shadow without detail a quarter of an inch square will pass in a half-plate negative, but when this is enlarged to about four diameters it will be very evident. Similarly there must be no large patches of unrelieved white in the lights. There must be no need to apologise for the fact that the picture is an enlargement, and with proper methods there is no need that there should be. A careful selection of a suitable paper should be made. As a rule, I use rapid bromide paper, but with some negatives a slow paper, such as Vitegas, gives a far better result. It is not a waste of time to make a strip test so as to get absolutely correct exposure in the case of negatives thicker or thinner than the usual run, as this will save a second exposure on a full sheet, or remove the temptation to pass an enlargement which is not as good as it should be. I have known a man who had a reputation to keep to make half a dozen exposures before he was satisfied. With a strip test this should not be necessary. Do not economise in developing solutions. When large sizes are being handled the developer rapidly loses strength, and poor colours result. Fix thoroughly, moving the prints frequently to ensure even action, and wash thoroughly from one dish to another. These are not the methods used in making 20 x 16 for 1s. 9d., but they should be for high-class work. Of carbon and platinum enlarging technics I will say nothing, for I assume that anyone who undertakes this work knows his business; others should give it to a first-rate trade house, and they will not be disappointed.

As regards apparatus, for general convenience the ordinary type of lantern with condenser will be found the best, and as a general rule better quality is obtained by using a ground-glass diffuser between the light and the condenser, as this minimises the effect of retouching medium or tiny scratches on the film, especially when using an arc light. Probably the best results can be obtained by using daylight or arc lamp light reflected from a white screen, but this is not always possible.

The enlarging apparatus should have a permanent position, so that it is always ready for use, no time being lost in getting ready for work. It should, however, be examined before use, as lenses have a way of attracting dust, and if this is allowed to remain it means flat prints. Films should be sandwiched between two carefully selected glasses, free from scratches or bubbles, and if they do not extend to the rebate of the carrier, the margins should be protected by a paper mask. If black paper is not to hand, brown will do; even newspaper is better than letting a flood of light pass round the edges, as this causes a general fogging which is not always detected. Recently I was challenged on this point, and to prove my case I made two exposures, one with the edges clear and the other masked; the difference in quality was so great that I was surprised, although I had always practised masking. Michael Angelo, on being twitted upon his attention to trifles, said, "Trifles make perfection, and perfection is no trifle." I commend this dictum to all photographers, and to none more than to those who wish to make perfect enlargements. Slap-dash methods may be successful to a certain point, but the best work calls for the exercise not only of intelligence but industry, and once one has got into the proper way of working it is no more troublesome than careless methods which frequently necessitate doing the work twice.

PRACTICUS.

TRUE-TO-NATURE PHOTOGRAPHS.

QUITE apart from any consideration of the artistic composition of a photograph, it must have been borne upon the mind of every photographer, or, indeed, on the mind of every one who carefully considers a photograph, that there is some relation between the distance of the object photographed, the focal length of the lens, and stop, which will give the most pleasing results. Further, the photograph can be viewed from a particular distance which may be better than any other.

It may not be everyone's opinion that what is termed a "true-to-nature" photograph is most pleasing to the eye, but a brief discussion of the matter is interesting, and in the writer's opinion throws some light on the reason why some photographs seem unnatural and perhaps displeasing. During last year the Department of Scientific and Industrial Research published a translation of Dr. Gleichen's "Theory of Modern Optical Instruments." In this book, among many other matters which it will repay the thoughtful photographer to study, is a discussion on the conditions which are essential to the theoretical "true-to-nature" photograph. It is the object of this article to present these conditions in a form which can be easily "understanded by the people," and to make some comments thereon.

Now, Dr. Gleichen's definition of a "true-to-nature" photograph is one which, when viewed at a certain determined distance from the eye, will impress upon the retina an image in all respects as to size and definition in all planes, similar to the image produced upon the retina by direct vision of the object photographed. Dr. Gleichen states that two conditions must be observed, viz. :—

(1) The entrance pupil of the objective must be equal in size to the entrance pupil of the eye.

Without involving any considerable error, we may substitute for entrance pupil of the objective the diaphragm or stop of the lens, and for entrance pupil of the eye the actual size of the pupil.

Now, the diameter of the pupil of the eye varies according to the light from 3 to 8 millimetres, consequently the diaphragm of the lens should be about 1·5 inch in diameter. No doubt it is to this condition that the artistic photographer will take the strongest exception.

(2) The equation $D = \frac{P}{B} + mL$ must be satisfied, where

D is the power of the lens or reciprocal of its focal length.

P is the reciprocal of the distance of the principal object of interest from the lens.

L is the reciprocal of the distance at which the photograph must be held from the eye.

m is the magnification to which the photograph may have been enlarged.

B is the lateral magnification at the entrance and exit pupils of the objective, which, since most lenses are symmetrical, will be taken as unity.

Hence the equation reduces to this form

$D = mL + P$.

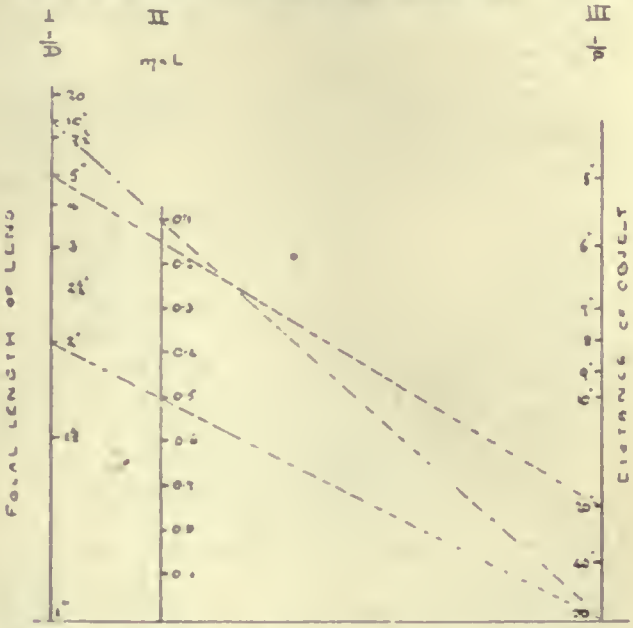
It must be observed here that of course the same units of length must be employed throughout the equation.

This result at which Dr. Gleichen arrived may be presented in a form ready for instant solution by means of the annexed diagram, which links up the variables D, mL, and P.

The diagram consists of three parallel lines, I., II., and III.

On line I. is marked the focal length of the lens.

Line II. is marked in divisions giving values of mL, or the pro-



duct of the enlargement and the reciprocal of the distance which the finished photograph is to be held from the eye.

Line III. is marked with the reciprocal of P, or the distance of the principal object from the camera.

The use of this diagram is simplicity itself. A ruler laid across the three lines will cut each line at the precise value of the variable to satisfy the aforesaid condition.

For example:—A distant landscape is photographed with a lens of 10 inches focus. The line connecting 10 inches on line I. with the infinity mark on line III. cuts line II. at a value of 0.1.

Now for the normal eye L may be taken as 10 inches (the distance of distinct vision). Therefore m equals 1, and the photograph, if not enlarged, must be held about 10 inches from the eye.

Again, a photograph of a distant object is taken with a lens of 2 inches focus. The line in this case gives a value of mL of 0.5. If this photograph is enlarged 100 diameters on a screen $100 \times L = 0.5$, or $L = 1/200$, and the oberver must be 200 inches, or, say, 17 ft. from the screen. If the enlargement be 200 diameters, the observer would have to be 33 ft. from the screen.

For a third and last example:—An object 20 inches away is photographed by a lens of 5 inches focus. Here mL is 0.15, and it is seen that if m be taken as unity L=0.15, and the eye must be held 7 inches from the photograph, or better, the photograph should be enlarged two diameters and held 14 inches away. It is interesting to observe that the diagram confirms the old rule that a photograph of a distant object shold be viewed at a distance from the eye, equal to the focal length of the lens with which it was taken.

HARVEY COLLINGRIDGE, B.Sc.(Lond.).

FORTHCOMING EXHIBITIONS.

April 17 to May 22.—Hammersmith Hampshire House Photographic Society Annual Exhibition. Two open classes. Joint secretaries, J. G. Abrahams, 41, Hamilton Terrace, London, N.W.8; A. H. Page, 12, Lime Grove, London, W.12.

LIEUT. A. F. LOVEDAY, of the Photographic Section of the R.A.F., has been demobilised, and is now back at Holborn in charge of the Professional Department of Messrs. Houghtons, Ltd. 88-89, High Holborn, W.C.

LIEUT. A. W. TIPP, R.A.F.—Friends of Lieut. Tipp will be interested to know that he is now demobilised, and is returning to his civilian post of representative of Messrs. Thomas Illingworth and Co., Limited. Lieut. Tipp will call upon professional photographers only in London, the southern suburbs and home towns, the northern suburbs and home towns being worked by Mr. Craft, formerly manager of Illingworth's trade enlarging and printing department, which was permanently closed about three years ago. The dealers in London and suburbs will continue to receive visits on Messrs. Illingworth's behalf from Mr. Fred Giles, who has been "carrying on" with both dealers and photographers during the war.

TIME DEVELOPMENT WITH MONOMET-HYDROQUINONE.

A CORRESPONDENT having recently asked us for data and formulæ for time development with Monomet-hydroquinone, the White Band Manufacturing Co. kindly send us the following particulars, of which no doubt many others than our enquirer will be anxious to make use:—

MONOMET-HYDROQUINONE: ONE-SOLUTION FORMULA.

Monomet	2 gms.	9 grs.
Hydroquinone	8 gms.	36 grs.
Sodium sulphite (anhydrous)	15 gms.	70 grs.
Sodium carbonate (anhydrous)	25 gms.	110 grs.
Potassium bromide	0·4 gm.	3½ grs.
Water	1,000 c.c.s.	10 ozs.

TIME AND TEMPERATURE FOR ABOVE DEVELOPER, WATKINS SYSTEM FOR PLATES.

75 deg. F.	1¾ minutes.
70 deg. F.	2¼ minutes.
65 deg. F.	3 minutes.
60 deg. F.	4 minutes.
55 deg. F.	5 minutes.
50 deg. F.	6¼ minutes.

For VVQ plates, dilute 100 volumes with 125 of water.
For VQ plates, dilute 100 volumes with 70 of water.
For Q plates, dilute 100 volumes with 30 of water.
For M plates, multiply development time by 1.
For MS plates, multiply development time by 1¾.
For S plates, multiply development time by 2¼.
For VS plates, multiply development time by 3.

MONOMET-HYDROQUINONE: TWO-SOLUTION FORMULA.

(A)	Monomet	2 gms.	45 grs.
	Hydroquinone	8 gms.	90 grs.
	Potassium metabisulphite	25 gms.	550 grs.
	Potassium bromide	0·4 gm.	8 grs.
	Water	400 c.c.s.	20 ozs.
(B)	Sodium hydroxide (caustic soda)	15 gms.	330 grs.
	Water	400 c.c.s.	20 ozs.

Take equal quantities of A and B, and dilute as required.

VVQ, dilute 100 volumes to 375.
VQ, dilute 100 volumes to 320.
Q, dilute 100 volumes to 280.
MQ, dilute 100 volumes to 250.
M, dilute 100 volumes to 190.
MS, dilute 100 volumes to 150.
S, dilute 100 volumes to 112.
VS, no dilution required.

TIME AND TEMPERATURE TABLE FOR TWO-SOLUTION FORMULA.

75 deg. F.	1½ minutes.
70 deg. F.	2 minutes.
65 deg. F.	2½ minutes.
60 deg. F.	3 minutes.
55 deg. F.	3½ minutes.
50 deg. F.	4 minutes.

For tank development, the above solutions may be diluted with a further quantity of water up to five times the original volume, and the time of development increased proportionately.

MEASUREMENTS OF PLATE-SENSITIVENESS TO X-RAYS.

COMPARATIVELY few investigators have published results of experiments on the sensitometry of plates to X-rays. A number of results, accompanied by a description of the methods used in obtaining them, were published in a paper by Millard B. Hodgson, of the Eastman Research Laboratory, which appeared in the "British Journal" of December 28, 1917. The following abstract of a paper by Miss N. C. B. Allen and Professor T. H. Laby, read before the Royal Society of Victoria last year, shows the value used by these experimenters in obtaining measurements of inertia, contrast, and speed of plates by sensitometric exposure to X-rays. The plates were developed in strips for a constant time of four minutes with hydroquinone developer at 68 deg. F., the density of a fog strip being deducted. The density measurements were made with a polarisation photometer. As the expression of the exposure the authors adopt the formula $\frac{V^2 i t}{d^2}$ where V is the pressure in volts of the current supplied to the Coolidge tube: $i\ t$ in coulombs the consumption in current by the tube during a period of action of t seconds and d the distance of the focus of the tube from the sensitive plate in centimetres. The tube was employed at three different voltages—namely, 31,500, 73,000, and 83,000. Current variations ranged from 0.03 to 0.06 milliamperes. By plotting the densities obtained against the logarithm of the exposure according to the above formula the curve obtained was broadly similar to that produced in H. and D. measurements. In the case of densities ranging from zero to about 1.0 the curve exhibited convex formation towards the log exposure axis, then following a straight line to densities of about 4.0, which were the highest measured. By producing the straight line portion of the curve to meet the log exposure axis a point was obtained representing the logarithm of the inertia of the plate, a quantity which was found to be independent of development. Contrast was taken as expressed by the inclination of the straight portion of the curve, whilst "speed" is provisionally and empirically defined by the authors as the reciprocal of the exposure required to produce a density of 5.0. In comparing the results obtained with the different voltages ranging, as already mentioned, from 31,500 to 83,000, the authors found that for a constant "exposure" the density produced did not vary with the voltage so long as variation of i and t was small, indicating that in the case of the wave-lengths employed the density produced depends on the energy of the radiations but is independent if their particular wave-lengths. The following results are quoted:—

	Inertia.	Contrast.	Speed.
Diagnostic	·71 × 10^3	2·2	15 × ·00001
Sunic	1·00 —	2·35	12 —
Seed	1·12 —	1·9	6·6 —
Wratten	1·95 —	2·2	5·2 —
Wellington	1·70 —	2·0	5·0 —
Imperial X-ray	1·26 —	1·6	3·6 —
Cramer	2·14 —	1·9	3·5 —
Ilford	2·19 —	1·9	3·3 —
Imperial S.R.	1·45 —	1·55	2·8 —

[Apparently the plates named are not all of them the special X-ray plates of the makers. Only two, which are known to us, are included in the table, and it is thus open to doubt whether the authors, in the case of the others, are referring to the "ordinary" plates or to those specially made for radiography.—Eds., "B.J."]

KODAK (AUSTRALASIA), LTD.

THE newspapers just to hand from Australia tell of the remarkable success of Kodak (Australasia), Ltd., which began as from June, 1908, with a small deficit representing preliminary expenses. It was formed nearly eleven years ago to amalgamate the Baker and Rouse and Australian Kodak interests. The Sydney "Bulletin" thus shows the progress of the business:—

Mar.,	Profits.	Dividends.	Written Off.	Reserves.
1909	£22,038	9 p.c. = £11,250	£596	£9,714
Sept.,				
1909	12,984	10 ,, ,, 7,500	358	14,840
1910	25,273	10 ,, ,, 15,000	3,869	21,244
1911	24,346	10 ,, ,, 15,000	3,067	27,523
1912	36,227	12½ ,, ,, 18,750	5,219	39,781
1913	36,890	12½ ,, ,, 18,750	5,238	52,183
1914	40,640	12½ ,, ,, 18,750	6,240	68,333
	Transferred to capital, £30,000		...	38,333
1915	54,228	15 p.c. = 26,250	5,852	60,459
1916	76 132	20 ,, ,, 36,000	6,538	94,053
1917	66,517	20 ,, ,, 36,000	6,657	117,913
1918	66,673	20 ,, ,, 36,000	5,942	142,644

The earlier profits were helped somewhat by the sale of assets—shares in the Eastman Kodak Co., of Rochester, U.S.A., for recent figures have not been swollen in that way. Since the war started, the Company has been on what our Anzac friends term "a fine wicket," partly because its Kodak connection guaranteed an ample supply of raw materials for the local factory. Further, when Uncle Sam got busy on war supplies, the American Kodak people passed their Asian and Maoriland business temporarily into Australian hands. The big increase in profits during the past few years has been due almost wholly to the greatly increased output of the factory, and the directors are given the following testimonial: "The policy followed during the war of increasing prices only when absolutely necessary has been continued; so that plates, papers, films, and cameras are still being sold here

(Australasia) at considerably lower prices than are ruling in England." Another view of Kodak's progress can be obtained from the following comparison, also from the business page of the "Bulletin":—

	1909.	1917.	1918.
Liabilities	£28,015	£59,531	£76,886
Freeholds	52,100	95,196	100,637
Plant, etc.	28,120	21,724	18,295
Stocks	33,135	166,541	181,745
Shares in other cos.	77,071	12,430	12,430
Book debts, cash, etc.	9,880	70,552	95,423

The Company started with a paid-up capital of £150,000, and shareholders have put up nothing further since, though capital has been increased by the transfer of £30,000 from reserves. In the nine and half years covered by the figures liabilities have increased by £48,871. Properties and buildings alone now stand in the books at £48,537 more, after the directors have clipped 2 per cent. off the value of the building each year—an unusual but wise proceeding. Meantime, £148,560 has been added to stocks and £20,902 to other more or less liquid assets, while plant, though extensive additions have been made, now stands at £9,825 less than formerly, owing to the very liberal allowances made for depreciation. Shareholders have done exceedingly well. On their original capital they have received in the ten years dividends totalling over 172 per cent., and even then there has been left in the business an amount some thousands in excess of the £150,000 capital they started with. Nowadays there are net assets of a book value of almost 37s. to represent each £1 share (including, of course the bonus shares); and excepting possibly stock (which, no doubt, has been accumulated at war prices), they are a particularly solid lot of assets. There are very few balance-sheets which indicate so clearly as Kodak's what the directors are doing in the matter of depreciation. Further, not a penny is represented by goodwill, trade-marks or processes, though at the moment they are undoubtedly worth a lot. The company lately acquired 120 acres at Kew (Victoria), where a model factory suburb is to be laid out.

Assistants' Notes.

Notes by assistants suitable for this column will be considered and paid for on the first of the month following publication.

Relative Proportions of Negatives and Enlargements

When making, buying, or selling enlargements, it is often useful to know beforehand exactly what size a standard negative will enlarge to without loss of some portion of the picture, also how much of a negative can be enlarged to a standard size without cutting down the paper.

For instance, we all know that a p.c. negative won't enlarge to 15 x 12 without losing some part of its length, but how many could say—without experiment—what it would go to on 15 x 12 paper, or how much of it could be included without reducing the width of the final picture?

The following tables give approximately the sizes that the most common negatives will enlarge to on standard sized paper.

They are extracted from a list compiled by the writer and used with benefit by a firm of trade enlargers.

Half-plate 6½ × 4¾ will enlarge to:—
8½ × 6½ on 1/1 plate paper
10 × 7⅞ ,, 10 × 8 ,,
12 × 8⅞ ,, 12 × 10 ,,
15 × 11 ,, 15 × 12 ,,
20 × 14¾ ,, 20 × 16 ,,

To fill any of the above standard sizes from a half-plate, it is necessary to cut something from the end or ends of the picture.

Post Card 5½ × 3½ will enlarge to:—
6½ × 4½ on ½-plate paper
8½ × 5¾ ,, 1/1 plate paper
10 × 6½ ,, 10 × 8 ,,
12 × 7⅞ ,, 12 × 10 ,,
15 × 9½ ,, 15 × 12 ,,
20 × 12¾ ,, 20 × 16 ,,

Postcard will not fill any standard size without losing nearly a quarter of its length.

While 5 × 4 will give:—
10 × 8
12 × 10 (nearly)
15 × 12
and 20 × 16

it is too *wide* for half-plate and whole-plate, giving only:—

5½ × 4¾ on ½ plate paper
and 6½ × 8⅛ ,, 1/1 plate ,,

To fill these sizes it is necessary to lose a little from the *sides* of the negative.

12 × 9 c.m. will enlarge to:—
6½ × 4¾ on ½ plate paper
8½ × 6½ ,, 1/1 plate paper
10 × 7½ ,, 10 × 8 ,,
12 × 9 ,, 12 × 10 ,,
15 × 11½ ,, 15 × 12 ,,
20 × 15 ,, 20 × 16 ,,

Except with half-plates, a 12 x 9 negative will lose in length if the paper is filled.

Quarter-plate, 4¼ × 3¼ will enlarge to:—
6½ × 4¼ on ½-plate paper
8½ × 6½ ,, 1/1 plate paper
10 × 7½ ,, 10 × 8 ,,
12 × 9½ ,, 12 × 10 ,,
15 × 11½ ,, 15 × 12 ,,
20 × 15½ ,, 20 × 16 ,,

Quarter plate is a shade long for all sizes except whole-plate.

3¼ × 2½ will enlarge to:—
4½ × 3 masked p.c.
6½ × 4½ on ½-plate paper
8½ × 6 ,, 1/1-plate paper
10 × 7½ ,, 10 × 8 ,,
12 × 8½ ,, 12 × 10 ,,
20 × 14½ ,, 20 × 16 ,,

This size also needs the length trimming off before standard sizes of paper can be filled.

4¼ × 2¼ 1A. F.P.K. film will enlarge to:—
5¼ × 3 (masked p.c.)
6½ × 3⅞ on ½-plate paper
8½ × 5 ,, 1/1 plate paper
10 × 5⅞ ,, 10 × 8 ,,
12 × 7 ,, 12 × 10 ,,
15 × 8⅞ ,, 15 × 12 ,,
20 × 11½ ,, 20 × 16 ,,

No standard size can be filled by projection from a I.A. negative without losing over a third of its length.

3¼ x 2¼ (2 Brownie film) will enlarge to:—

4⅞ × 3⅜ (masked p.c.)
6½ × 4½ on ½-plate paper
8½ × 5⅞ ,, 1/1-plate paper
10 × 6⅞ ,, 10 × 8 ,,
12 × 8 ,, 12 × 10 ,,
15 × 10½ ,, 15 × 12 ,,
20 × 13⅞ ,, 20 × 16 ,,

This size is a shade long in proportion to standard papers.

1⅞ × 2½ (V.P.K. and 0 Brownie film) will enlarge to:—

5½ × 3½ (post-card)
6½ × 4¼ on ½-plate paper
8½ × 5⅜ ,, 1/1-plate paper
10 × 6½ ,, 10 × 8 ,,
12 × 7⅞ ,, 12 × 10 ,,
15 × 9⅞ ,, 15 × 12 ,,
20 × 13 ,, 20 × 16 ,,

As to cutting out for filling the paper, V.P.K. is practically proportionate to postcard.

The above measurements are correct to eighths, but, of course, do not take into account possible shrinkage of paper or distortion due to want of parallel between the negative and paper during exposure.

THERMIT.

Photo-Mechanical Notes.

Buying Engravings Cheaply.

The greatly increased prices of engravings has naturally incensed some purchasers, and there is a discussion in the current American "Photo-Engravers' Bulletin" on this subject. An article is quoted from "Advertising and Selling," in which the author describes several methods of avoiding payment of the prices fixed by the "standard scale" of the employers' association. For example, a charge is made for colour proofing. It is suggested that for simple work in two colours merely black proofs are sufficient, the second proof being made on tissue paper, which can be laid over the first proof to determine that the register is correct. With regard to minimums it is suggested that as many as possible should be put together and then sent to the printer or electrotyper to cut apart, thus saving the minimum charge for each block. Also, since photo-engravers charge for areas whether the whole area is filled or not, the purchaser should have his drawings made for a standard amount of reduction and fill in the spaces with his own drawings, just as the engraver fills in his "flat" by stripping-in different negatives into any spaces he has.

In reply, a photo-engraver points out that the charges of the standard scale are based on ascertained average cost, and that if all the devices mentioned were resorted to by the customer it would only mean that the prices would have to go still higher. He protests that the engraver should not be considered as a robber, but should be regarded as an ordinary business man who is fully aware that honesty is the best policy, and that if the customer goes to him expecting to get his work done in the most economical way having regard to quality, the engraver will, in his own interest, help him in his problems. If you cannot trust him, then do not go to him any more than you would to anyone else you would distrust, but you may be as confident of getting a square deal from the engraver as from anyone else whose services you buy, and this would seem to be a reasonable attitude.

No one would try to trick his dentist in the ways similar to those suggested, yet the dentist has for sale just what the engraver has—namely, service. He manipulates a bit of metal which you take away with you when he stops a tooth, and the engraver does the same when he reproduces a picture, the value of the metal being fractional in either case. The only difference is that the operation of the engraver is more complicated, and, due to the customer wanting the result speedily, it has to be subdivided amongst several men instead of being carried out by one, but laboriously acquired skill is used in both cases, and it is chiefly the time expended in exercising this skill that must be paid for. One seldom hears of a dentist leaving a fortune, and a photo-engraver never.

Saving Wet Plate Negatives.

With the high cost of glass it is impossible to store negatives on the chance of their being required again, and it is very expensive even when there is a certainty. But there is no reason why negatives that will strip so easily as those made on wet collodion should not be saved. If a thick stripping collodion is used, or two coatings given, they may be stripped and kept between the leaves of a book. Certainly they are somewhat fragile, and are easily damaged, but with care they may be used over and over again. If a stiffer film is required, the negative may be placed on a levelling slab and flowed with a warm 10 per cent. solution of gelatine, which, when dry, will give the film considerable substance, or the plan has been adopted of stripping the film on to pieces of thin celluloid, when they can be handled as easily as an ordinary film negative.

Repeat Orders for Engravings.

If catalogue or other negatives are stored away under a proper indexing system they can be used for repeats, and so save the engraver the cost of making a new negative, and often afford the customer a quicker service just when he wants it badly.

The method of storing and indexing is as follows. Each job is given a number, and when finished this number is marked on the proof. The proof is now put in a classified file so that if an inquiry for an illustration is received again from the same customer—and some advertisers repeat the same illustrations over and over again, and believe in having original half tones rather than electrotypes—the folder containing the proofs of all the engravings made of that article is examined, and if a suitable size is there the number is noted. The negatives, having been stored away under the same number in numerical order, can be found at once.

Rotary Photogravure from Flat Plates.

It would seem that sooner or later means will be devised for printing photogravure etchings which have been made on flat plates on the rotary printing machine, judging from the attention which inventors are paying to this subject. The great difficulty has been, of course, the joint. There must be some method of avoiding this joint showing on the printed result, and of preventing injury to the "doctor" blade which scrapes away the ink from the engraving. In a recent patent granted to Mr. Ruddiman Johnston he mentions no less than six British patents taken out with the same end in view. They are as follows:—14,819 of 1899, 25,050 of 1907, 13,153 of 1913, 4,018 of 1915, 10,550 of 1915, and 100,616 of 1916. Mr. Johnston's own patent is No. 117,888, and his proposal is to bridge the interval at the joint by a detached metal plate fastened to the cylinder to make it with the etched plate a continuous surface, and then to raise the doctor blade slightly when it reaches the junction by means of a cam so that the knife is not injured.

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Applications, April 22 to 26:—

Studio Accessories.—No. 10,212. Photographic studio accessories and means for operating the same. E. J. Clayton.

Viewing Instrument.—No. 10,325. Photographic apparatus for viewing, retouching, or copying. A. E. Morten.

Photographic Shutters.—No. 10,414. Electrically-operated camera shutters. H. M. Batten.

Flash Lamps.—No. 10,413. Electric flash lamps for photographic purposes. H. M. Batten.

Cinematography.—No. 10,441. Shutters for cinematographic apparatus. R. H. Bataille.

Stereo-Cinematography.—No. 10,242. Stereoscopic pictures, cinematograph photography. J. Evans.

COMPLETE SPECIFICATIONS ACCEPTED,

These specifications are obtainable, price 6d. each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

Print Trimmers.—No. 124,173 (December 30, 1918). The invention relates to apparatus for trimming photographic and drawing papers, of the kind described in the specification of Merrett's patent No. 11,709 of 1908, provided with a fixed cutting shear and a pivotted cutting blade or guillotine knife, between which the paper or other material is cut.

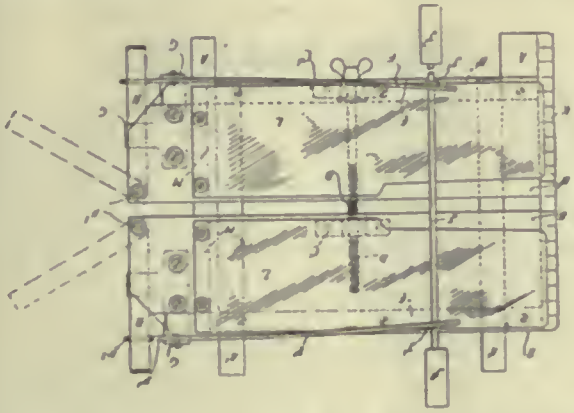
The object of the present invention is to provide improved apparatus of this kind in which the cutting means are duplicated; that is to say, arranged with a shear and a cutter on each side of the apparatus, so as to produce at one operation two simultaneous and parallel cuts at adjustable distances apart. By the present invention it is possible to cut cards, paper, etc., along both sides simultaneously, the distance between the cuts being variable within the limits of adjustment of the apparatus.

In the drawing A represents the base of the apparatus, to which a table B is rigidly secured. On the under side of the table B is fixed a nut C, through which works a screw D rotably mounted in a bracket C^1 on the underside of a second table B^1, secured to batons A^1 bearing against the frame A.

To each table is secured a fixed cutting shear E and a bracket

G, in which is pivotted a guillotine knife F, having a slight inward curve, and provided with a tail piece F¹, which is curved and bevelled as shown at F². On this curved and bevelled face F² normally bears a spring H which serves to keep the knife edge against the shear edge E during the downward movement of the knife and to return it to its initial raised position when the cut is finished. The spring H is pivotted at H¹ to the underside of the table so that it may be removed from the guillotine knife into, say, the dotted position, for convenience in packing the apparatus.

The two knives F are secured by loops, hooks, or the like



attaching means J' to a rod J carrying handles or the like holding means J'. K represents an ordinary graduated scale, which is secured to the base A for the purpose of determining the distance of the opening between the tables B and B¹; L, L are strips of celluloid or other transparent material; and M M are adjustment strips against which the forward edge of the paper or the like is pressed during the cutting along its sides. John Merrett, Trowbridge, Wilts, and Archie Thomas, 1, Adcroft Street, Trowbridge.

Machine Gun Camera.—No. 123,999 (May 26, 1917). The camera is designed to provide means whereby markmanship can be practised by means of photographs which can be exposed by the airman along an optical line parallel with and adjacent to what is normally the line of fire.

The invention thus comprises a camera in which the camera casing is of the form and dimensions of the magazine of a machine gun, the camera being adapted to be bolted in the usual position of the magazine to allow of photographs being exposed.

In the drawing, the casing 1 which may carry a lens tube 7, is in the form and dimensions of the magazine of a machine gun. The casing is bolted to the machine gun 2 in the usual position of the magazine. 3 indi-

cates the back sight, and 4 the front sight. These sights are adapted to give an optical line coinciding with the line of fire of the machine gun. The trigger release lever 5 is adapted to be operated by the trigger 6 of the machine gun to start clockwork mechanism, which is provided within the casing for actuating a sensitive film, so that it is passed across the shutter from a feeding spool to a receiving spool. Charles Duncan Miles Campbell (the late), Major, R.F.C., 17, South Vale, Upper Norwood, London; and Colin Martin Williamson, 28, Denmark Street, London.

CATALOGUES AND TRADE NOTICES.

Butcher's Abridged Catalogue.—Messrs. W. Butcher and Sons, Ltd., Camera House, Farringdon Avenue, E.C.4, have just issued a 190-page list of the many models of their hand and stand cameras, mounts, and albums, as well as of the other items of equipment of the amateur photographer. The list shows the very wide choice which is offered to the buyer of a camera.

The Ensign 1919 Catalogue.—Messrs. Houghtons, Limited, 88/89, High Holborn, W.C.2, have just issued a miniature edition of the goods of theirs in the way of cameras of all patterns, enlargers, and a host of minor accessories of interest to the amateur photographer. It is too early yet to look for new models of apparatus, but the list will be welcomed by amateurs (as well as by dealers), for whom the coming summer opens again the opportunity for photography.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Saturday May 10.

Huddersfield Naturalist and Photographic Society.—Excursion to Woodsome Hall.

Monday, May 12.

South London Photographic Society.—"The Negative." W. F. Slater.

Tuesday, May 13.

Royal Photographic Society.—Ordinary Meeting. "Development Papers and Desensitisers." W. C. Mann.
Hackney Photographic Society.—"Amateur Photographer." Prize Slides.
Manchester Amateur Photographic Society.—"War Time Photography." A. D. Pyke.

Wednesday, May 14.

Croydon Camera Club.—Print Display.
Photomicrographic Society.—Members' Evening.

Thursday, May 15.

Hammersmith (Hampshire House) Photographic Society.—"More Curiosities Seen Through the Microscope." G. Ardaseer.
Rodley and District Photographic Society.—Monthly Competition, "Clouds."

ROYAL PHOTOGRAPHIC SOCIETY.

Meeting held Tuesday, May 6, Mr. F. F. Renwick in the chair.

The President, Dr. C. Atkin Swan, gave a demonstration of carbon printing, of which no formal report can adequately represent the way in which the demonstrator worked, chatted, and joked through the technicalities of the process. Briefly sketching the historical development of pigment printing, Dr. Swan mentioned that the finishing touch to earlier experiments was put by his namesake, the late Sir Joseph Swan. They were not related, and as Sir Joseph Swan died the year after he, the lecturer, was born, he could not claim to have assisted him in his researches. He advised beginners in the process to buy the tissue ready sensitised. The makers charged the same for it as for the unsensitised tissue—he had never been able to understand why. The sensitised tissue required to be kept in a calcium box, and would then keep in good condition for a long time. A test of its condition was simply to soak a strip of it first in cold water for a minute or so, and then in hot water, when the pigment should dissolve entirely away, leaving a pure white sheet of paper, if the tissue was in working order. By means of a supply of printed tissues placed at his disposal by the Autotype Company, Dr. Swan demonstrated the operations of squeegeeing on to the transfer paper and of development. If one sensitised tissue oneself on a bath of potassium bichromate containing a little ammonia, the bath should be used at a temperature not lower than 55 deg. F. and not higher than 65 deg. F He insisted that he always made it a practice to test the temperature of the sensitising bath with a thermometer, but in development he never used a thermometer, but gauged the advisable heat of the water by the rough-and-ready test of having it at a temperature comfortably warm to the back of the hand. At his invitation members of the audience came to the demonstration table and carried out the squeegeeing and development of prints themselves, a part of the proceedings in which Dr. Swan was assisted by his wife. The sensitising of tissue by the spirit method was also demonstrated. After the asking and answering of a few questions, the very hearty thanks of the meeting were accorded to the President by acclamation.

CROYDON CAMERA CLUB.

Messrs. T. P. Middleton and F. W. Kent demonstrated "Kerotype Transfer Paper" last week, which received the full approval of a large audience. The paper has been previously described in the "B.J.," and consists of a gaslight or bromide emulsion on a translucent base, from which it can be stripped and transferred to almost any material.

Unless the sensitive surface is exposed through its support, the image on its final resting-place is, naturally, reversed. A slight loss of quality results in so exposing through the support, of no consequence with some classes of work if undesirable with others. In the latter case, double transfer is resorted to, which seems to present no difficulty. Thin films can, of course, be printed through the celluloid, and when enlarging all that has to be done is to present the glass or celluloid side of the negative towards the paper.

Luckily for the manufacturers, they can afford to laugh at familiar troubles occurring in the paper, for impurities are isolated from the emulsion by the impregnated wax. Consequently, a Kerotype print can be transferred to any paper selected, with no fear of those spots which lately have afforded many a professional cold feet and a warm vocabulary, as print after print has been thrown out, due to "metallics."

Notwithstanding, makers of bromide papers list a large number of papers of varying surfaces and weights, etc.—far too many, in fact—yet the list might be almost indefinitely extended and still a familiar type would not be satisfied, as the particular "shade of difference," which, in its opinion, "makes all the difference," would be bound to be absent. This type, usually, is not a paying proposition, but to such Kerotype will appeal.

In addition, although a small print can be applied to a large sheet of paper to give a picture surrounded with a white margin, probably at less cost than employing a large sheet of bromide paper, and masking (which procedure again dodges the aforesaid "metallics"), yet the chief appeal seems to be in the direction of transfer to what may be termed unusual supports, such as fabrics, wood, china, and glass. Many examples were shown, some pictures on white wood being particularly effective, as were others mounted, in crystoleum fashion, on the concave side of a large lens, and backed with white dental-plaster. One anchovy-paste pot with photo. on top made such a tasty knick-knack as to cause Mr. Harpur loudly to exclaim, "Won't mother be pleased!" And certainly the many pretty applications would have appealed strongly to the household, which chiefly acts as a setting to the pictorialist, receiving only reflected glory, apt to be unsatisfying. To those professionals who do not rise superior to side-lines of this order, the process is worth serious consideration.

Another point, if only a minor one, consists in the wide range of colours which may be obtained by toning, all methods applicable to lantern-slides being available. Some of these cannot be utilised for ordinary bromide papers, owing to the toning solutions precipitating in the fibres of the paper, causing a stain difficult, if not impossible, to remove.

At the conclusion of the demonstration, which was carried through in capital style, the president, Mr. John Keane, invited a discussion. This immediately elucidated that Mr. Walker was in trouble again. "What is the cause of this defect?" he asked; but the general laughter engulfed the answer. In reply to a question it was stated that the process was unsuitable for making transparencies for enlarged negatives owing to a slight granularity becoming then in evidence. The reason for such granularity had not been traced. Mr. Salt suggested "reticulation" as the cause. Mr. Middleton said that was his opinion, but others thought differently. Mr. Jobling pointed out that he had frequently secured quite sharp bromide prints by contact, by exposing through the glass to an ordinary electric bulb placed four or five feet away.

It transpired that the lamp referred to was of ordinary type, and possibly a focus lamp without reflector might enable the distance and exposure to be reduced. With the "Pointolite" arc conditions for sharp prints would be ideal. Also, modern types of battery lamps run off accumulators, present a close approximation to a point source of illumination. Half-watt from four volts are now made. On the proposition of Mr. Sellors, who expressed his pleasure at a return to a technical subject, a hearty vote of thanks was accorded the demonstrators.

Commercial & Legal Intelligence.

Legal Notices.—Notice is given of intended dividends in the failure of Frederick William Gray and Margaret Jane Gray (joint estate), photographers, lately residing at Newlay Villa, Newlay Wood, Horsforth, near Leeds, and carrying on business under the style of the Empire Studios at 11, Queen Victoria Street, Leeds. Similar notice is given with regard to the separate estate of Margaret Jane Gray. Proofs must be lodged on or before May 13 with the trustee, George Henry Volans, incorporated accountant, 2, Albion Place, Leeds.

News and Notes.

Lancashire Society of Master Photographers.—A final reminder to members of the society is made of the exhibition which opens at the Art Gallery, Blackpool, on May 27. The latest date for receiving exhibits is Thursday, May 22. Exhibits should be sent direct to: Society of Master Photographers, Art Gallery, Blackpool. They will be returned carriage paid after the exhibition. The annual general meeting of the society will be held at the Palatine Hotel, Blackpool, at 2.30 p.m., on May 27, and the annual dinner at 5.45 p.m. on the same day.

"The Professional Photographer."—We welcome the reappearance, after several months' suspension, of our contemporary of the Kodak Company. The April number, recently issued, contains an appreciation of Mr. H. J. A. St. George, the newly elected president of the P.P.A., and of Mr. Peter Elfelt, of Copenhagen, reproductions of whose very individual portraiture are published; Mr. F. C. Tilney writes on the physiology of posing, and there are notes on halation and variety in background. The production in the matter of typography and illustration is of the high standard which has always marked the little magazine.

An All-Australian Number.—We have to congratulate Mr. Walter Burke on the production of an issue of his journal, the "Australasian Photo-Review," in which the whole of the text and of the illustrations is contributed by Australasians. The articles include one by Mr. W. R. Davidson on the employment of photography in railway construction work in New Zealand; others have for their subject the items of practical work, such as development, gaslight printing, and mounting, which interest the amateur of whatever latitude. It was in 1914, very unfortunately for him, that Mr. Burke announced his intention of issuing each year an all-Australasian number of the "Review," yet, despite the handicap of the war, which carried a large proportion of his readers to Europe, he has successively published five issues which very admirably represent the journalistic endeavours of his readers.

Correspondence.

**** Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

**** We do not undertake responsibility for the opinions expressed by our correspondents.*

REPRODUCTION FEES FOR PRESS PHOTOGRAPHS.

To the Editors.

Gentlemen,—Is it not time that the P.P.A. or the Press Photographers' Association took up the matter of the fee for reproduction of photographs in the Press?

At present the fee remains at the pre-war price, 10s. 6d. each under 6 x 4. Surely with the great increased cost of obtaining Press photographs—railway travelling, hotels, motors, wages, and materials—it is time that the usual fee was increased to 21s., or at any rate 15s.

If all the Press photographers agreed, as the plate-makers and other companies did, to increase the price, the papers could not object, for it must not be forgotten that the papers are increased in price.

I should like to have other photographers' views on this matter, particularly the Press agencies in London.—Yours truly,

A Press Photographer.

SENSITIVE FERROTYPE BUTTON PLATES.

To the Editors.

Gentlemen,—We notice that in your reply to "A. L." in to-day's issue of the "B.J." you suggest that sensitive buttons are unobtainable, apart from any imported from America. May we point out that this is not quite accurate, as we have manufactured and supplied the sensitive button plates and discs for the last sixteen years. We therefore trust you will insert this letter to remove the impression conveyed that British users have to depend on foreign enterprise to meet their requirements.—We are, Yours faithfully,

p.p. The Quta Co.,
H. L. Hickox.

252-256, Haydons Road, Wimbledon, S.W.

PRESS v. PROFESSIONAL PHOTOGRAPHER.

To the Editors.

Gentlemen,—"L. T. W." is quite correct in asking for fairplay, but it comes rather as a shock to one who has been engaged in Press photography for a considerable period to hear that bona-fide Press photographers are guilty of such practices. I am under the impression, and a very strong one, that the camera man from Fleet Street is superior in his sportsmanship to the so-called Press photographers who are annoying "L. T. W." and others. At least this is my opinion of those I know, and I might mention that I am intimate with the cream of them.

In my opinion it is certainly most unfair if a man who is sent by a newspaper or photographic agency to do a job collars another man's picture which he has been "invited" (which, I presume, is the same as "ordered") to take, and the photograph is used for any other than Press purposes. This raises another question also. Does not the professional photographer, at times, at public functions also encroach on the Pressman's ground by submitting his work to the Press. If he intends to compete with the Press photographer he must not be annoyed at his competitor's persistency. The Press photographer is sent out by his newspaper or agency to get pictures for Press purposes, and it is up to him to get the best pictures possible; but I do not think that any of his employers would sanction him doing anything that was not fair and square.—Yours truly,

C. W. B.

THE NEW STANDARD PLATE SIZES.

To the Editors.

Gentlemen,—According to remarks in the last two weeks' issues, I am under the impression that an attempt is to be made by the manufacturers of plates, acting in unison, to refuse to supply the professional photographers with plates in the "postcard" size and in the time-honoured quarter-plate size. I somehow feel that I am surely labouring under a delusion. I am therefore writing to you to ask that the makers will be good enough to give us a clear understanding in plain words, and without ambiguity. There are thousands of photographers who have cameras, carriers, printers, and enlargers fitted for postcard-size plates, and thousands fitted for quarter-plates. Am I to understand that the plate-makers are combined together to prevent our obtaining supplies in these sizes, and by their "royal will and pleasure" we must give the "quietus" to all this apparatus, and sans question forthwith proceed to equip ourselves with new apparatus in sizes "dictated" by the firms who are kind enough to allow us the privilege of purchasing their manufactures, at their own prices, and do all this without demur. If this is so, it is a scandalous state of trade, and a crying injustice, and it chills the patriotic spirit of the times, which is "No Trade with the Enemy." It may create a sense of retaliation that would welcome imported goods. There can be no tariff protection which shelters such "brigandage."

The explanations as to the discarding of old sizes, in the manufacture of which they have made huge profits, are ridiculous. The motive is apparent, it is deeper. The majority of plates used are in postcard sizes, and it is their endeavour to compel us to use a larger size than necessitated for our purpose, at our loss and their profit. I take it you, as the organ of our craft, will give us opportunity to fully ventilate our grievance.—I am, Yours faithfully,

"25 Years a Plate-User."

Answers to Correspondents.

SPECIAL NOTICE.

In consequence of general reduced supplies of paper, as the result of prohibition of the importation of much wood pulp and grass, a smaller space will be available until further notice for replies to correspondents.

Moreover, we will answer by post if stamped and addressed envelope is enclosed for reply: 5-cent. International Coupon, from readers abroad.

The full questions and answers will be printed only in the case of inquiries of general interest.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

A. E. M.—You can get the vignettes from Mr. A. W. Bowen, 26, Dartmouth Park Road, London, N.W.

H. D. M.—No doubt Mr. R. E. Peeling, 6, Holborn Circus, London, E.C., will be able to supply what you want, or possibly undertake the repair.

D. T.—There is no doubt that the establishment of a studio comes within the Retail Businesses Order. The office to which to apply in your district is Queen's College, Paradise Street, Birmingham.

I. S.—The book by Ryland Phillips, "With Other Photographers," was published some years ago by Messrs. Kodak, but is now out of print. You might be able to get it second-hand, say from Messrs. Foyle.

E. B.—A toning bath which has been exhausted by over-use or has been made with bad sulphide, or with sulphide the stock solution of which has deteriorated by storage, is the most common cause of such bad colour.

L. E.—There is no means of removing the effect of the intensification. We should judge that nothing can be done with the negative unless it is possible to work up a print or enlargement from it, and from that to make a new one.

L. S.—Photographic memorials of the kind you mention, made in brass, are supplied by Messrs. Hood, Limited, Middlesbrough; on porcelain by Mr. J. W. Beaufort, Easy Row, Birmingham, and the Farquhar Vitrified Enamels Co., Derby Lodge, East Sheen.

H. M.—A whole-plate lens ought to cover satisfactorily. Apparently your lens is not a good one. Your best choice would be an R.R. of about 9-in. focal length, such as a Ross Rapid Symmetrical or Dallmeyer rapid rectilinear, both good lenses, which you can buy for a pound or two second-hand.

W. S.—(1) The inquiry is too indefinite for us to give you a satisfactory reply. How do you wish to combine the prints. Perhaps you could send us a sketch of proposed arrangement. (2) An enclosed arc burns steadily, uses less current and carbons, and the light is of a much more actinic character than that of an open arc.

A. F.—Sixteen feet is rather short for ordinary work, and especially so for groups. For full-length cabinets the lens should not be of longer focus than 8½ in.; 5¾ in. for full-length C.D.V. For groups on a half-plate, a lens of 6 or 7 ins. is the shortest which can be used, but we are afraid it would not be short enough.

H. H.—So far as we know, the Retail Businesses Order does not apply to Ireland at all. We have the text of the Order, but it mentions only Great Britain, and gives no address of an office in Ireland to which applications for licences are to be sent. So it seems pretty evident that no restriction of this kind applies to you.

C. B.—The firm have never made lenses, and we are unable to say now whether the R.R.'s issued with their name on them were made by a British or by a French maker. If French, the present

value of the lens would be about £3. A 15 x 12 R.R., of about 21 to 21 ins. focus, if by Taylor, Taylor and Hobson, Ross, or Dallmeyer, has a value of from five to six pounds.

M. M.—Acid short stop is any bath which promptly arrests the further development of the prints through the action of the developer contained in the film. One such formula is 1 dr. of acetic acid to about 30 ozs. of water. Another is, say, ¼ oz. potass. metabisulphite in 20 ozs. of water. Another is sodium acid sulphite solution, say, ½ oz. diluted to 20 ozs. of water.

F. J.—The licence applies to the business, not to the owner, and therefore there is no need to apply for a licence in taking over the existing business. The question of adding side lines such as picture-framing, is a debatable point, but in your particular case we should say that such a side-line is so very closely allied to the photographic business that it could not be considered a new retail business.

S. N.—If the condenser cell is nicked, it is probably in order that a thin bar, such as a steel rule, can be laid across in the nicks, and the one cell thereby unscrewed from the other. But if it is badly bound, very likely even that will not be enough, in which case there is nothing for it but to send it to some lens maker, who could make bosses to grip the two halves, and could possibly separate them.

E. S.—There is no other way of finishing high-class miniatures except the careful working in water-colours. A clever artist can do much with washes with the minimum of stippling. For the best work the carbon image is almost rubbed away before commencing work, but with cheaper qualities the carbon basis is left at full strength, and coloured in the usual way.

H. A.—We are sorry we do not know the suppliers of the Franklyn gloves. Judging from your description, they are for electrical work, and if you cannot get in touch with them through any local electric supply house, you might try the General Electric Company, Limited, 67, Queen Victoria Street, E.C., or a firm of dealers in aircraft supplies, such as Aircraft Equipment Limited, Long Acre, London, W.C.2.

R. K.—As stated in the review of the Brodrick drying cabinet, makers here have not produced apparatus of this kind. The only drying machines are American. The Kodak Company, Kingsway, London, W.C., supply one, but it is doubtful if they can now obtain deliveries from America. Another firm which has advertised apparatus of this kind in our columns is the Simplex Photo. Specialty Co., 337-339, East 34th Street, New York, U.S.A.

P. G.—(1) The No. 4 Busch portrait aplanat is 13 ins. focus. Pre-war price with iris diaphragm was £3. Current price to direct purchaser, say, £1 15s. to £2. (2) We have no particulars in our pre-war Busch lists of a rapid symmetrical. We should think it would be the same thing as the rapid aplanat of $f/8$, the half-plate lens of which is of 8-in. focus. Pre-war price was £1 15s. We should say that it would not fetch more than 10s. to 15s., as such R.R. lenses are fairly common.

W. J. B.—Special provision is usually made in the printing bed of a box printer for dealing quickly with film negatives printed with a white margin. There was a very simple and excellent device of this kind described with illustrations in the "B.J." of March 30, 1917, obtainable from our publishers, price 4½d. post free. You could easily adapt the idea of this to an existing printer, or you could use the masks sold for the purpose in all sizes by the firm of Artista, 5, Rue de Montfaucon, Paris, VII.

S. W.—There were two Warnerke sensitometers, the readings of which differed very considerably. It is, therefore, impossible to give an equivalent H. and D. number for the Warnerke degrees which you quote. The best we can say is that at the time the Warnerke numbers were used, say, 1880-1890, 24 degrees corresponded with something less than the fastest dry-plate then made. The fastest was 25 Warnerke. This would probably be only about 150 to 200 H. and D. as plates are now rated, in fact, we should say less than that.

G. T.—In so narrow a studio we do not think it would be desirable to have a movable frame for the lamps, otherwise your plan seems all right. It would be better to arrange the lamps in a curve, and you will not require any light so low as you have drawn it. The lights to the front of sitter should be from seven to eight feet from the ground, those at the side a little lower. We do not care for 2,000-c.p. lamps; the light will be better diffused and the exposures quicker with the same candle power in 1,000-c.p. lamps. These should each be fitted with a separate switch, as you will not always want them all in action.

S. H.—Your first step will be to make three negatives as equal in density as possible. Next make a strip test of each, developing for two minutes exactly. This will give you the correct exposure for each negative. Then get a large sheet of brown paper and cut an oval in the centre, large enough to vignette one head at a time. Mark on the edge of the bromide paper where the centre of each head is to come. Make the exposures successively through the oval, taking care not to raise or lower the paper as you move it. Then develop for two minutes. If you do not get an even result on the first trial, the second will probably be all right.

F. N.—If the portraits were not ordered, that is to say, if you took them on speculation and it was optional whether the sitter ordered copies or not, then, unquestionably, the copyright is yours, and all reproductions of any shape or form are infringements of it. It is usual for sitters in such cases to sign a formal assignment of copyright, but that is not absolutely necessary since in any action evidence would show whether the photograph was ordered or not. If you have any considerable interests affected by this infringement, the best thing you can do is to put the matter in your solicitor's hands, and allow him to be guided by the little handbook, "Photographic Copyright," which our publishers issue, price 1s. 2d., post free.

A. B.—1. You do not name the town, so that we cannot tell you whether the Licence Office to which you should apply is the Hotel Windsor, Victoria Street, London, S.W. (for Kent, Surrey, or Sussex), or 5a, Union Street, Bristol (for Hants, Dorset, and Devon). 2. Yes, certainly a suitable camera, although cheap photographers as a rule do not go in for anything so elaborate. A yellow screen is of no service. 3. There were formerly while-you-wait cameras taking miniature, postcards, and larger sizes, but they came from America and are now practically unobtainable. No doubt you could get one second-hand by spending a shilling or so on a small advertisement. They were sold chiefly by the Chicago Ferrotype Company. You might also try Messrs. J. Fallowfield, 146, Charing Cross Road, W.C.2, or the Billcliff Camera Works, Richmond Street, Boundary Lane, Manchester.

The British Journal of Photography.

The Oldest Photographic Journal in the World.

PUBLISHED EVERY FRIDAY. ESTABLISHED 1854. **PRICE TWOPENCE**

TERMS OF SUBSCRIPTION, POST FREE.

UNITED KINGDOM.—One Year, 10s. 10d.; Six Months, 5s. 5d. Three Months, 2s. 9d.

CANADA ... ...
AUSTRALIA ... ...
NEW ZEALAND ... ...
SOUTH AFRICA ... ...
UNITED STATES OF AMERICA
SOUTH AMERICA ... ...
INDIA AND FAR EAST ... ...
CONTINENT OF EUROPE ...

One Year. Thirteen shillings (13s.), or 3 dollars 17 cents, or 18 francs 50 cents, or 9 rupees 12 annas, or 6 yens 30 sens.

FEDERATED MALAY STATES, BORNEO AND SARAWAK 5 dollars 57 cents.

HENRY GREENWOOD & CO., LTD., Proprietors and Publishers, 24, Wellington Street, London, W.C.2.

IMPORTANT NOTICE TO READERS.—Until further notice agents will supply the "B. J." to order only, as the high price prevailing for everything in connection with newspaper production prohibit the distribution of surplus copies for chance sales. It is therefore necessary in order to ensure the regular delivery of the "B. J." each week to place an order definitely with a dealer, newsagent or bookstall clerk, or to send a subscription to the publishers.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3080. Vol. LXVI. FRIDAY, MAY 16, 1919. Price Twopence.

Contents.

	Page
Ex Cathedra	257
Minor Repairs to Apparatus	258
Drying with Spirit: the Cause of White Deposits and the Drying Efficiency of Spirit. By L. P. Clerc	259
Fourteen Points on Colour. By A. Vernon Godbold	261
Practices in the Studio. By Practicus	263
The Development of British Lenses for Aircraft Photography	264
Concerning Tone Values. By Professional	266
Patent News	268
Meetings of Societies	269
Catalogues and Trade Notices	270
Commercial and Legal Intelligence	270
News and Notes	270
Correspondence—	
Reproduction Fees for Press Photographers	270
Reversal in Tank Development	270
"New Sizes of Small Cameras and Plates"	270
Monomet-Hydroquinone Developer	271
Forthcoming Exhibitions	271
Answers to Correspondents	272

SUMMARY.

Mr. L. P. Clerc, in a communication to the French Photographic Society, has identified the cause of white deposits in the drying of negatives with spirit as the precipitation of lime salts from the wash-water as a solid solution of themselves in the gelatine of the emulsion film. He has also worked out data which provide a working basis as to the number of plates or prints which can be dried with a given quantity of spirit. (P. 259.)

In the third of the papers, contributed to the Royal Photographic Society, Messrs. Aldis Brothers have recounted their achievements in the design and manufacture of optical munitions of war, including lenses for aircraft cameras. (P. 264.)

In a contributed article, to be completed next week, Mr. A. V. Godbold has some hints to give to the photographic colourist. (P. 261.)

The article by "Practicus" this week deals in a general way with the means which a photographer having a studio in a town of medium size may take for obtaining business. (P. 263.)

At the Royal Photographic Society on Tuesday evening last Mr. W. C. Mann, chemist to Messrs. Thomas Illingworth and Co., read a short paper on the technical problem of avoiding desensitised spots in development-paper emulsion caused by mechanical impurities in the raw paper base. (P. 269.)

A remarkable case of reversal in tank development is brought to our notice by a correspondent. If any of our readers who have had a similar experience can throw light upon it, we shall be glad to hear from them. (P. 270.)

The British Photographic Manufacturers' Association, in the course of a letter amplifying their note published in our issue of April 25 last, make it clear that apprehensions are unwarranted as to plates for popular sizes becoming unobtainable. Even the change, on the part of camera manufacturers, from the present to the proposed standard sizes, is to be a very gradual one (P. 271.)

In a leading article we have some hints to give on such minor repairs to cameras which properly come under the heading of renovations, and can be readily done by anyone possessed of the average handiness in the use of tools. (P. 258.)

Mechanism of film cameras and an improved pattern of folding pocket camera are among the patents of the week. (P. 268.)

Provision in the dark-room for the backing of plates is one of the factors which cannot be neglected without sacrifice of quality in the negatives of many subjects. (P. 258.)

A very practical method of introducing titles into view negatives is by assembling the view and title negatives upon a larger sheet of glass. (P. 258.)

EX CATHEDRA.

The Colonial Number. It is evidently a sign of the more or less speedy return to fresh and rejuvenated national conditions that the announcements by British firms in the forthcoming Colonial and Foreign Number of the "British Journal" already assure a wide and important representation of the several divisions of the trade. In the case of some firms no doubt the inducement to advertise is small as a result of orders which have gone on accumulating for the past year or two, and which will call for some considerable time for their execution. Nevertheless, it is satisfactory to find that firms in this position, as well as those who can do with as much business as they can get, are recognising the value of the opportunity of bringing their name directly before the thousands of buyers in quantity of photographic goods to whom the issue is sent. But whatever may be the special circumstances of a firm, it is, we think, plain beyond the possibility of denial that the manufacturer or merchant who considers not merely the immediate future but the "long shot" is alive to the necessity of meeting foreign competition by keeping the resources and prestige of the British photographic trade before buyers throughout the world.

* * *

Developing Bromides by Time. Despite the enormous number of bromide prints which are now produced, there is a comparatively small proportion of them which can be placed in the first class for quality. The weak point with most workers is incorrect exposure and in a smaller degree insufficient development, the general practice being to over-expose and under-develop. The first result of this is to produce prints which are not uniform in depth and colour, for the simple reason that unless developed singly it is very difficult to allow exactly the same period of development for each. If we compare a dozen bromides from an ordinary studio with a hundred printed and developed by an automatic machine we shall find much greater variation in the former than in the latter, because with the machine-made ones the exposures are all uniform and all have the same amount of development. Makers of bromide paper usually mention two minutes in a normal amidol developer as the time necessary to obtain a proper depth, but it is not uncommon to find printers giving thirty seconds or less. It may be imagined that more time is occupied if the development is carried on for the correct period, but this is not so, as more prints can be handled in the solution at once. If correctly exposed the action of the developer stops, and over-development is impossible. This can be demonstrated by anyone possessing such a machine as the Graber, which will evenly expose any number of prints which are afterwards developed in strips. We have seen a man handle forty or fifty strips in the developer at once,

and the results were quite uniform in colour. Exposures should be calculated to give proper depth with from two to three minutes' development, and for normal negatives there should be little if any bromide put in the developer. It is impossible to get rich sepia tones by any process on prints which are insufficiently developed, because there is not sufficient silver deposited to give the colour when turned into sulphide.

* * *

Titling Prints. When large numbers of prints bearing a title or other wording are required the system usually employed by publishers, that of stripping the title from a special negative and transferring it to the subject negative, is doubtless a good one, but requires considerable practice to do it neatly, unless wet collodion be used for the titles, when the stripping can easily be done. An easier plan for the ordinary operator is to make his title or lettering on a process plate and to cut it and the view negative to the required size and shape, assembling them upon a sheet of glass, to which they are secured with lantern slide binders, or red paper and rubber solution. We have seen a souvenir card consisting of a title, a verse, and the signature of the poet, the latter copied from a letter treated in this way with a very happy result. One half-plate negative was taken of the title and verse, one of the signature, and these were cut and fixed above and below the view negative (also a half-plate reduced in width), which was direct from nature. The finished print was of whole-plate size showing a good margin. Although the original order was for a hundred copies only, the job was so well appreciated that in the end five times that number were supplied. When only a few copies are required it is quite easy to put in titles by double printing, which can be most easily effected in a printing box. To ensure correct placing of the title, it is necessary to make a pencil line on the back of the bromide paper while it is on the subject negative in the exact position the title should occupy, and to lay this line upon the title for the second printing. If a film manufacturer would give us thin celluloid, coated with process emulsion, titling would be much simplified.

* * *

Backed Plates. Now that the season for outdoor work is again with us a word as to the value of backing plates for almost every class of subject will not be amiss. Nearly everyone uses backed plates for interiors in which windows have to be included, but many stop at this and do not think them necessary for ordinary outdoor work, with the result that, although there is no pronounced sign of halation, there is a general flattening of the lighting. This was perhaps less noticeable when slow plates with fairly opaque films were more generally used, but most modern rapid plates are inclined to be transparent and more liable to halation. It may be necessary to point out that this does not imply a lack of silver in the film, but only a difference in its condition. Unfortunately, the plate makers' price for backing has gone up in sympathy with that of the plates themselves, and this has led some who previously used backed plates exclusively to provide them only for exceptional subjects, a practice which often causes them to be out of reach when most wanted. Every dark room should contain a pot or tube of backing colour and a small sponge to apply it with; if diluted with methylated spirit it will dry so quickly that when half-a-dozen plates are wanted the first will be dry enough to put into the slide by the time the last is coated. Although the makers have now abandoned the red backing in favour of black, the red answers perfectly in most cases. What is needed is to destroy the reflective character of the inner surface of the glass, and it is interesting to note that the white backing of the now defunct self-developing plates was quite effective. We remember seeing a photograph of an ordinary upright incandescent gas light taken on one of these without any trace of blurring.

MINOR REPAIRS TO APPARATUS.

In the preservation of photographic apparatus in a satisfactory working condition many little repairs can be done by anyone with no more than the average degree of handiness, and the delay involved in sending the apparatus away for repair thus avoided. As many of us well know, it is not the time actually taken by the professional repairer which deprives one of one's apparatus for so long a period, but the time which elapses before a particular job can be taken up in its proper place among other waiting orders. Therefore, we may usefully refer to some of the more ordinary defects to be found in cameras and other commonly used apparatus and give some indications of simple means of repair.

If the camera has experienced a good deal of use in damp weather out of doors, and has not always been thoroughly dried after use there is a tendency for the screws in its mahogany body to become loose or even fall out, a state of things which is the more likely to occur if the wood used in the first instance has not been fully seasoned. If it is a case simply of a few loose screws due to wear, it is quite an easy matter to plug the holes and thus obtain a firm hold for the screw. The best way to do this is to get a few odd pieces of cigar-box wood and, taking a small piece slightly larger than the whole diameter of the head of the screw, to whittle it down so that it will just fit tightly into the hole, the piece being given a slight taper. It is worth while taking a little care in order to get a good fit. The wood is then lightly coated with seccotine or ordinary glue and gently hammered into the hole as far as it will go. All the holes needing treatment in this way should be attended to and the camera put aside for the adhesive to harden thoroughly before the projecting ends of the inserted wood slips are cut off and the screws re-inserted. This is a far better plan than making shift with a larger screw, even when that is possible, which is not always the case, owing to the small aperture of any little brasswork fitting which is secured by the screw. We have even cured the same trouble occurring in the case of a blunt-ended screw having a worn thread on a small all-metal camera by cementing it in with fish-glue. On a field camera there is sometimes a tendency for the nuts and thread which hold the strut carrying the front and the reversing back to suffer wear at the point where strength is most required, that is, between the shoulder and the nut and the strut of the camera. A couple of brass or copper washers or burrs, such as are used when riveting, if placed between the nut and the strut will help to give a firmer grip unless the wear is very bad. In renewing worn brass screws a word of caution may be given. On no account should the screws be replaced by those of steel, or there is certain to be the occasion of regretting this trifling and false economy. We remember once fastening a lens flange to its panel with steel screws. In the course of time, during much outdoor use, the screws rusted in so firmly that when it was wished to sell the lens it was impossible to get the flange off without a certain damage to the lens panel.

Most probably any camera which had any long usage will require some repair work to the bellows. Pin-holes are best mended by sticking a piece of cloth, or, better still, thin leather, over the part. Black cloth is, of course, the most suitable, and an odd piece bought from a dealer

in book-binder's requisites will serve for a good many jobs. While this repair is in hand the bellows should be carefully examined with a view to discovering any worn places which may come to be a source of leakage without being suspected. If the bellows are very old, it is most probable that they will sag in the centre, especially if of any considerable length. It is not at all a difficult matter to make such serviceable for a considerably further period. Let the camera be racked out to its full extension and the bellows given a coating, inside, of very thin liquid glue. Great care should be taken to brush the liquid well into the folds, but it should not be applied too thickly or it will be a very long time in drying. Some people apply the glue also to the outside folds of the bellows, but it is susceptible to damp, and it is better to use copal varnish for the outside. The varnish can, indeed, be used for the inside, though not quite so good a stiffener. A few days at least should be given, with the camera fully extended, for the stiffening coating to dry. It may soon seem dry enough, but is liable to cause sticking of the folds when the camera is closed unless given the opportunity to become thoroughly hard. The inside should, of course, receive a fresh coat of dead black.

The amateur repairer is not recommended to undertake any jobs on shutters, at any rate, those of the between-lens type. To do so usually means more work for the professional repairer. The rubber bulb of the release can be easily tested for tightness by squeezing it under water and any part which shows leakage can be patched like a cycle tube.

The woodwork of the camera should have a careful polishing with a good furniture polish, taking care to avoid touching the lacquered brass fittings with the polish. Some brands of polish which we have used will remove lacquer. If only field and studio cameras were regularly renovated by the photographer as though they were valuable furniture there would be fewer complaints of their failure to withstand any wear. Some of the apparatus that we have seen has been in a disgraceful condition, woodwork dull and lacking in polish, even clammy with overmuch handling. No wood is like mahogany for showing every mark upon its surface, but a good occasional polishing and a frequent rub over with a dry, soft cloth and chamois leather will do much to keep its good appearance and condition.

Dark-slides which are not perfectly light-proof are a source of constant apprehension to their user. We are all of us familiar with the operator who needs to hold his slide rolled up in the focussing cloth until the very last minute, and even while inserting it into its groove feels the necessity of carrying out manipulative feats in order to prevent possible admission of light. The most likely source of leakage is the division between the two halves of the slide, due to shrinkage of the wood through rapid drying after exposure to a damp atmosphere. A way to remedy matters in this respect is to cement a layer of fairly thick black velvet along the edge of the slide round all four sides. This will make the catches hold more tightly as well as provide a trap for any entrance of light. We have several times repaired book-form slides in this way, and have had no trouble from leakage of light afterwards. If the hinged flaps on the shutters are worn they may be renewed with small strips of leather cloth or book-binder's cloth cemented over the previous one. It may not sound a good plan, but we have used it many times. Usually there is ample room in the cut-off of the slide for the very little extra thickness which the leather cloth represents.

DRYING WITH SPIRIT: THE CAUSE OF WHITE DEPOSITS AND THE DRYING EFFICIENCY OF SPIRIT.

M. L. P. Clerc, who, during the greater part of the war, has taken an active share in the Photographic Section of the French aerial service, has made the following contribution to the "Bulletin of the French Photographic Society." It will be seen that problems arising from the employment of photography upon different parts of the Western front have been shown, on investigation, to have a very direct relation to those met with in ordinary indoor work where alcohol is used for the rapid drying of negatives.—Eds., "B.J."]

In almost all the sections employing aerial photography in conjunction with the French army service there cropped up at one time or another the production of a white opalescent deposit between the glass and the gelatine film of negatives hastily dried after immersion in an alcohol bath. The defect was often marked upon parts of the plate which were the first to dry, and particularly showed itself after long immersion in undiluted spirit followed by rapid drying with the aid of heat. The defect has frequently been attributed to the inferior quality of the spirit which was used, but it is produced just as easily when the pure alcohol is employed. It is entirely due to the salts of lime in the wash water, and has been found to occur most readily in those sections of the army occupying parts of the front in a chalky or limestone region, such as Artois, Picardy, Champagne, and Woevre.

Bicarbonate of lime, which is present in all waters (with the exception of distilled water and freshly collected rain water) is a salt which is regarded as necessary for rendering a water palatable, but on evaporation it leaves carbonate of lime, forming the chief part of the incrustations on boilers and of the fur in kettles.

When the negative is dried without having previously been immersed in alcohol, the gelatine prevents the precipitation of this carbonate of lime, which, thus protected, forms with the gelatine a transparent homogeneous mixture, that is a solid solution. It is known, moreover, that colloids, of which gelatine is the most perfect type, are able to confer the colloidal state upon substances which otherwise would not assume it.

But bicarbonate of lime, while soluble in water, is completely insoluble in alcohol, and the white turbidity which is formed when alcohol is diluted with ordinary water is due to the precipitation of this salt. Now, when a negative is placed in alcohol before having been left to dry, there is a tendency for the precipitation of carbonate of lime from the water with which the gelatine is impregnated, but if the replacement of the water by the alcohol is not complete the protective part played by the gelatine is still exhibited by a retardation or a prevention of the precipitation, at any rate up to a point of sudden upset of the equilibrium by very rapid drying.

This precipitation may be compared with the formation of a grain by the drying of the familiar ground-glass varnish, consisting of a solution of resins in ether, to which a small proportion of benzole has been added. The benzole alone does

not dissolve the resin, and added in excess would precipitate them from their solution in the ether. On drying, the ether, which is the more volatile of the two liquids, is the first to evaporate, and thus leaves an excess of benzole, which precipitates the resins as a grain. A varnish without benzole would leave a transparent film; a varnish containing a large proportion of ether gives a very fine grain, particularly if the drying is very slow; whilst a varnish containing much benzole, or one which is dried too rapidly, gives a coarse grain. It will be seen, therefore, that there is a certain resemblance to the formation of the deposit of lime salts by alcohol.

On the one hand, the deposit is not produced in negatives which are rinsed in distilled water, however long they may be immersed in fresh spirit; on the other hand, the deposit is produced as readily with pure alcohol as with denatured spirit, which shows that the cause of the deposit lies in the water employed for washing. If the deposit is due to the precipitation by the spirit of bicarbonate of lime, soluble in water but insoluble in alcohol, it should be possible to produce the deposit under other experimental conditions, using any salt which is soluble in water but insoluble in alcohol, such, for example, as carbonate of soda.

Three plates (fixed and washed) were soaked in a 1 per cent. solution of carbonate of soda. One of them, A, was left to dry spontaneously; another, B, was soaked for ten minutes in a spirit bath which had become somewhat diluted by previous use, and was then put to dry in a moderately warmed room; the third plate, C, after immersion for ten minutes in the same spirit bath as that used for B, was soaked for a further ten minutes in fresh alcohol, and then dried before a good fire. The periods of drying were respectively one hour, half an hour, and five minutes. Plate A is perfectly transparent; plate B shows only a very slight deposit, and that existing in the corner of the negatives which was highest in the draining rack, and thus dried the first; the plate C has the appearance of an opal glass.

In order to avoid with certainty the formation of this white deposit on negatives dried with alcohol, it is necessary either to use a water free from lime salts, such as distilled water, rain water, or water which has been treated with a disincrustant, or to convert the bicarbonate of lime which is contained in the gelatine into a salt, which is soluble not only in water but also in alcohol, immediately before placing the negatives in the alcohol.

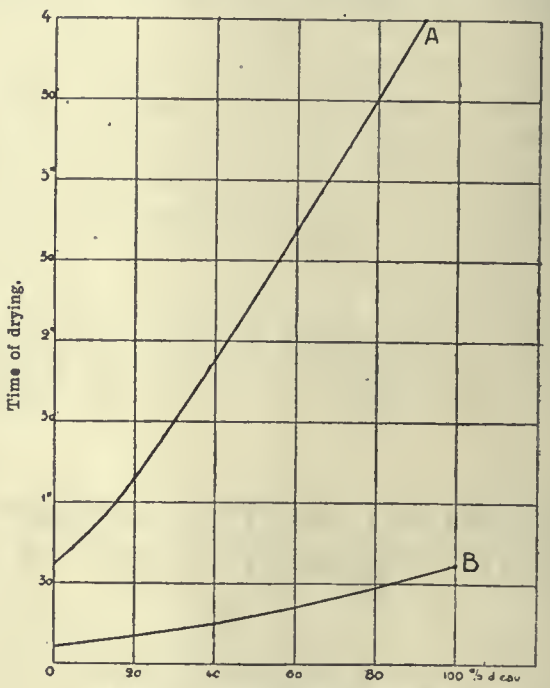
Now, the chloride, nitrate, and, to a lesser degree, the acetate of lime are soluble in alcohol, and are immediately formed when carbonate of lime is brought into contact with a solution (which may be a very dilute one) of a corresponding acid. The immersion of the negatives immediately before putting them in the spirit in a weak bath of hydrochloric acid (10 c.c.s. of commercial acid to a litre of water) suffices to avoid the formation of the deposit on drying.

Sulphate of lime, like the bicarbonate, is present in almost all waters, and is also insoluble in alcohol, but it is generally present in smaller quantity than the bicarbonate. Moreover, it is much more soluble in weak solutions of hydrochloric or nitric acid than it is in pure water, the solutions thus acidified giving no precipitate on addition of alcohol. The immerson of the negatives in weak hydrochloric acid thus provides a preventive of precipitation of this compound.

It should be understood that the acid solution should be liberally used and frequently renewed in order to avoid any saturation of the acid by the successive introductions of the lime salt.

In cases where the omission of this precaution or its improper application should have allowed the deposit to be formed, subsequent treatment requires to vary according to the character of the deposit. If the deposit covers a fairly large surface of the negative, the latter should be passed through a bath of the diluted hydrochloric acid and dried again. If the deposit exists simply as a patch of small area, it will disappear by directing the breath upon it for a few minutes. The carbonate of lime re-dissolves under the action of the moisture and carbon dioxide of the expired air.

A question of some importance in the drying of negatives with spirit is the effect of the strength of the spirit upon the duration of drying. After having found that the time of drying of a negative treated with spirit is almost independent of the time of immersion in the spirit when this latter is greater than ten minutes, we investigated the effect of progressive dilution of the spirit on the time of drying, the period of immersion of the negative in the spirit being kept constant at ten minutes. For this purpose gelatino-bromide plates and papers of 13 x 18 cm. size were fixed, washed, and then placed respectively in denatured spirit of 90 degs. used in admixture



Proportion of water in 100 vol. of spirit.

Fig. 1.

with water, so that the proportion of water to 100 parts of spirit ranged from 10, 20, to 90 parts. After allowing five minutes for draining, not included in the time reckoned as drying, the plates and papers were left to dry spontaneously at a constant temperature of 64 degs. F., away from air currents, each plate placed alone on a draining rack and each print hung freely by a string without having been blotted. The results of these tests are shown in the curve, Fig. 1, where the curve A corresponds with plates and B with papers. Plainly no absolute value can be attached to the times thus determined, since in all drying operations the quality and thickness of the gelatine and the conditions of drying are variable quantities. But it is seen that the effectiveness of spirit as an accelerator of drying falls off very quickly as the solution is diluted, the times of drying being relatively to that of drying after treatment with fresh spirit, doubled when the spirit contains 20 per cent. of water.

It remains to discover approximately the number of negatives or prints of a given size which could be treated with a given volume of alcohol at this dilution, which is considered as the practical limit in the use of alcohol. In order to calculate this number, ten 13 x 18 cm. plates and ten 13 x

18 cm. sheets of bromide paper were fixed and well washed. After washing, the plates and papers were drained and the wash water collected and weighed. Plates and papers were then weighed first wet, then after complete drying. The figures obtained were as follows :—

	One plate 13 x 18.	One sheet 13 x 18.
Weight, wet	83.8 gms.	7.5 gms.
.. dry	81.0 ..	4.7 ..
Water absorbed.....	2.8 ..	2.8 ..
.. drained	3.8 ..	2.3 ..

From these figures, and assuming that after ten minutes' immersion in the spirit bath equilibrium is established between the liquids in and outside the gelatine, assuming also that

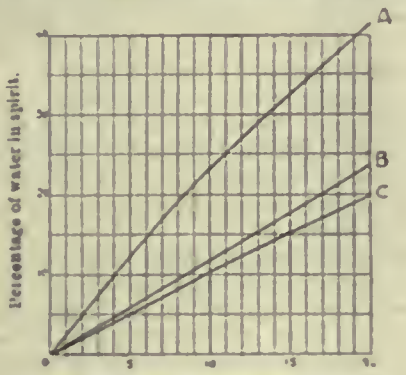


Fig. 2.

the volumes of alcohol absorbed by the plates or papers are respectively equal to the volumes of water above determined, and neglecting any evaporation of alcohol, we calculated, for an initial volume of three litres (3,000 c.c.s.) of alcohol, the progressive dilution for each plate or each sheet of paper according to the three methods of handlings :—

A. The plates or papers are taken roughly from the last wash water into the alcohol bath, without intermediate draining, and removed quickly from the alcohol bath, the drainings of alcohol being lost.

B. The plates or papers are drained before immersing in the spirit, but not on removal from the spirit, the latter drainings being lost.

C. The plates or papers are drained before and after immersion in the alcohol, the spirit drainings being collected and returned to the spirit bath.

Comparisons made by means of an hydrometer between the spirit bath after use, according to the different conditions just mentioned, together with observations of the numbers of negatives or prints and of the dilutions at which the alcohol was used, have shown a satisfactory agreement between calcu-

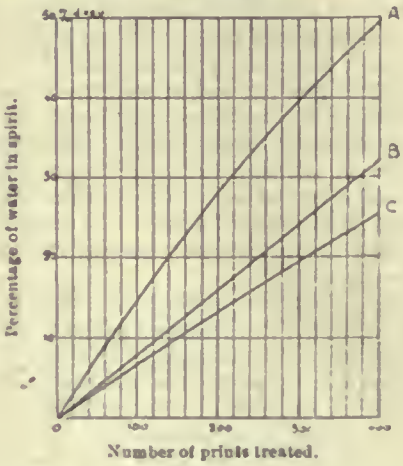


Fig. 3.

lation and practice, the same denatured alcohol and the same wash water being employed. Diagrams Figs. 2 and 3 show the numbers of negatives or prints thus determined, in particular the dilution limit (introduction of 20 parts of water per 100) is reached after treatment of :—

EXPERIMENTAL CONDITIONS.

	A.	B.	C.
Plates	102	200	240
Papers	135	250	305

Comparison of these figures emphasises the practical advantage of draining negatives and of draining or, still better, of blotting prints before and after their treatment in the spirit bath, and spirit drainings being returned to the latter bath. A more economical employment of the process is obtained by passing negatives or prints successively into two spirit baths, the second of which thus becomes diluted very slowly. The dilution of the first bath may then reach as much as 50 parts of water per 100 before it needs to be replaced by bath No. 2, and the latter by fresh spirit. L. P. CLERC.

FOURTEEN POINTS ON COLOUR.

1. PHOTOGRAPHERS in the near future will have to interest themselves in the question of colour, if they are not doing so, as it is such an important element in portraiture, and as regards handwork is practically the monopoly of professionals, and a line, if it is given due consideration, which will enhance the profits. There are plenty of middle-class people who can afford, and wish for, a truthful portrait in colour if it can be done without a lot of fuss and bother to themselves. Workers of the future will be earning more money, and are already taking more pleasure in their homes, and will want portraits with an added charm.

2. Colour has been called the sunshine of art, as it assists wonderfully in the expression of beauty, but unfortunately its use and application do not seem to be governed by laws, as in the case of composition and light and shade. If we turn to books on colour they not only demand a lot of time for study, but they are too theoretical to be easily understood, and it seems difficult for an artist to get help out of them in their present form, or to be able to refer to such books for a scheme of colour for a particular purpose like one can refer to B.J.A. for a formula. The greatest difficulty in arranging a colour design is the qualities and quantities of colour entering into a scheme of harmony. These and several other points are not dealt with in books on colour, for the simple reason that a number of fine specimens are required to display what cannot be given in words; therefore I should like to see a colour theatre or college established in London for displaying fine specimens, for lectures, latest results of colour photography, colour organ displays, and other items of interest to artists, designers, florists, etc. As it is, artists practically have to teach themselves by studying appearances and referring to acknowledged portrait masterpieces. Fortunately there are plenty for our guidance, as colour is the quality which has contributed to their preservation.

3. "There is one quality of good colour," to quote Professor Church, "which lies at the very root of all successful employ-

ment of vivid hues. It consists in minute variations of hue and tone within the same surface. A colour must not be absolutely uniform, flat and monotonous unless it be very pale, very dull, or very dark when the absence of this 'throbbing' or 'palpitating' quality, though undesirable, is less observed. We have before us as we write a fine old Chinese vase of turquoise crackle. Apart from the mosaic texture, resulting from innumerable fissures in the glaze, what a number of variations in appearance does this turquoise colour offer! Where the colour is thinnest it is paler and verges more upon green; where it is thickest it is at once deeper and more blue, and there are innumerable hues and tones. In painting similar effects may be produced by unequal glazings and scumblings of one hue upon another." What artists sometimes call "accidental" colour, only got by mixing colour on the palette—the airbrush is too mechanical to give it—an unconscious picking up and applying of tints gives this play and is, no doubt, what Whistler had in his mind when he explained "that it was impossible to produce the same masterpiece twice over—as difficult as for a hen to lay the same egg twice."

4. The influence of design on colour can only be explained by showing the same pattern in various schemes of colour. In making a complex colour arrangement it is well to begin by planning first its leading parts, the additions will then be easier. The colour of an object may be beautiful, but much of that beauty may be lost or neutralised by its surroundings. Harmony of colour must come not alone from the object we are planning, but also from the person who is to wear it. As an example, take a man's portrait dressed in black and seated, colour it and make the background a rich blue, then show it to a critic, he will at once say: "Bad colour, background comes too forward, looks cheap, the face appears leathery, etc." But you use the same blue on a lady's coat trimmed—collar, cuffs and flounce—with black velvet, and show it to the same critic; he will say, "Who's the lady?" which means he is interested, and it is pleasing.

5. If you have strong contrasts of colour the contrasts of tone between them must be small. The Japanese often made the most successful use of violent contrasts of colour by being careful that they should be the same tone value. And again, where you have strong contrasts of tone, such as Rembrandt was fond of, you cannot successfully have strong contrasts of colour as well. If Reynolds wished to paint a lady in a dress of gold silk with a blue background he made a compromise by making all the shadows of the dress and accessories a brown colour to keep a harmony in his work. It will be found in nature that her general colour scheme is divided into warm and cold colours. Harmony arises from the reflection of one colour upon the adjoining, so as to produce a blending, interlacing of the various hues, producing a chain of connections between the extremes of hot and cold. The practise of this was the success of the Dutch school. The colour of flesh indoors is cool in the lights and warm brown in the shadows. It is said Delacroix was so surprised to find, when his model put his head out of the window he was a different colour: that flesh showed its true colour in the open air with cool violet shadows. A portrait does not depend upon a number of little touches, but upon the big relation and differences of warm and cool colours simply employed. Whistler obtained his harmonies by employing tone and variations of a limited number of colours.

6. Photography is remarkable for the ease in which gradations of tone melts imperceptibly into each other without strokes, lines, dots, or scratches, therefore—as every material speaks its own language—it is not advisable to destroy by sloppy brushwork, its chief characteristic, but to maintain this and the high-class appearance of the paper that manufacturers strive to supply. Those who can admire bold brushwork over the exactness of a photograph can enjoy a drum accompaniment to a mandoline. Students turn to books on painting for assistance, and get led astray about brushwork, which rightly belong to oil and water-colour sketching from nature. Why try to hide the photo base when experts can easily detect it?

7. Compare Gainsboro's thin painting, which is esteemed for beauty and freshness to Hogarth's heavy, solid paint. Rembrandt's early work is smoothly painted, and quite as vigorous as his late and much rougher style. The vigour of effect depends on truth of tone, of light and shade, not on thickness and roughness of paint.

8. The colourist has definite colours for the face, dress, and hair, the background being left entirely to the artist's skill, and as so much depends on the importance of the colour support, it is hoped the following will be helpful. As some sort of guidance to a student, it is pointed out that great masters very often made use of the small interval of colour, like Velasquez's "King of Spain"—the coat is black and the background black. Holbein's "King Henry VIII."—the coat is light blue against a darker blue background. Leighton's "Moretta"—the dress is apple green against an olive green. Millais' "Bubbles" is green velvet against olive brown. These are just a few thought of at random. It is impossible to give rules, but the general tendency is a complementary colour behind the figure, and its contrasting colour in front. In some of the old masters the background is gray, the coat black, and the waistcoat yellow. With ladies this is easier to arrange if the background is greenish and the dress red, the contrast is by means of a string of blue beads. If a little of the colour of interest is repeated in the background it links the parts together. The use of a contrasting colour separates the subject from the background. If you are compelled to use contrasting colours which do not perfectly harmonise, a way out of the difficulty is to mix a little of each colour with each other. Say a bright red dress and a full green background take a little of the edge off the green with some of the red and carry a little of the green into the shadows of the dress. This method, with other strong contrasts, should give an improvement.

(To be continued.) A. VERNON GODBOLD.

SHEFFIELD AND DISTRICT PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.—A meeting was held on May 7 in Stephenson's Café, a fair number of members being present. After passing the minutes of the last meeting, a discussion took place on the proposal of the Ministry of Labour to train discharged officers and soldiers with a view to becoming proprietors of photographic businesses. After a long discussion, the matter was left in the hands of Mr. Gould, who originally brought up the subject for discussion, that he might gather more information on details which were at present doubtful. A very interesting topic then brought forward was "The Best Method of Studio Artificial Lighting for Portraiture." Half-watts, Marion's Northlight, the Westminster and Jandus arcs, and mercury vapour all had champions, and some very interesting opinions were heard. The subject was so interesting that "last-car" time came when arguments were still unfinished, and the theme will be further pursued at the next meeting. The Association welcomes new members. The hon. sec.'s address is 137, Pinstone Street, Sheffield.

PHOTOGRAPHIC NAVAL WAR RECORD.—Arrangements are being made by the Admiralty for a permanent exhibition in the Imperial War Museum of a complete photographic record of every ship of both the Royal Navy and Mercantile Marine employed during the war, together with a series illustrating, so far as is possible, every incident of interest or operation with which the sea forces were connected. The Admiralty invite any member of the public, and especially officers and men who have been demobilised from the R.N., R.N.R., and R.N.V.R., to contribute photographs or negatives, depicting subjects of interest from the naval point of view, which have been taken during the period of hostilities at home or abroad. The Director, I.W.M. Photographic Depot (Naval Section), 12, Coventry Street, W.1, will consider photographs or negatives submitted.

PRACTICUS IN THE STUDIO.

[Previous articles of this series, in which the aim of the writer is to communicate items of a long experience in studio portraiture, have appeared weekly since the beginning of the present year. It is not thought possible to continue the series to the length of that by the same writer which ran through the "British Journal" some years ago, but if any reader among the younger generation of photographers, and particularly those engaged as assistants, has a particular subject which might be dealt with, his or her suggestion will be welcomed. The subjects of the previous articles of the series have been as follows:—

A Talk About Lighting (Jan. 3).
The Camera and the Lens (Jan. 10).
Managing the Sitter (Jan. 17).
Backgrounds (Jan. 24).
Studio Exposures (Jan. 31).
Artificial Lighting (Feb. 7).
Printing Processes for Portraiture (Feb. 14).
Studio Accessories and Furniture (Feb. 21).
The Surroundings of the Studio (Feb. 28).
Studio Heating and Ventilation (March 7).
The Postcard Studio (March 14).
The Printing-Room (March 21).
About the Reception Room (March 28).
Home Portraiture (April 4).
Portable Studios (April 11).
Copying (April 18).
Handling the Studio Camera (April 25).
More About Lenses (May 2).
Enlargements (May 7).

ADVERTISING THE STUDIO.

I assume the object of everyone who starts a photographic business to be that of making money. To make money you must get orders, and to get orders you must announce to that section of the community whose patronage you seek that you are willing to serve them. An American humourist has said that trying to do business without advertising is like winking at a girl in the dark: you know what you are doing, but nobody else does. As competition increases, advertising becomes more and more necessary, and we can prove this by referring to any old newspaper of twenty-five or thirty years ago. Then one found no drapers' advertisements; now we find the most prominent positions, even whole front pages in the great dailies, occupied by people in this line of business.

Now, the first thing the photographer has got to realise is that although he may be an artist he is also a tradesman. Not only photographers, but many painters and sculptors suffer either from a lack of knowledge on this score or a false pride which will not allow them to recognise the fact. I know more than one painter of great ability who has a hard job to make ends meet because they are retiring men who are incapable of elbowing their way into "society" and getting talked about. Let it not be imagined that I recommend any artist, whether photographer or painter, to degrade his art by pandering to popular taste, against his own instincts, but to place of his best boldly before the world and await results.

There are a few photographers who have made a name in the way usually followed by artists—that is to say, by being present at any public function or social event to which they can obtain the entrée, and by sedulously seeking introductions to all who may be useful to them; but this way is obviously not open to the majority, who have to cater for all classes, and must attract attention in a more businesslike way. As the superior person would put it, they must stoop to the practices of the tradesman.

In the first place, I take it for granted that a photographer has established himself in a locality congenial to his own tastes, for if this be not so the cleverest advertising will not avail him. A man whose natural venue is Bedford Park will be hopelessly out of his element in Bow; and so with many other places.

An error which is made by many people who should know better is to start advertising before the goods are ready for delivery. Much money is wasted every year in this way; therefore, it is necessary to see that everything is in full running order before seeking publicity. Nothing is so disappointing to a would-be customer as to arrive at a new studio and to find it still in the hands of the decorators. I well remember a lesson which a friend received in this way. He had advertised the opening of his studio in an effective way, and when the most important lady in the locality came for a sitting he had to explain that owing to some unforeseen difficulty his studio camera and lens had not arrived from London. He offered to take her with an outdoor outfit, but she was accustomed to good-class London studios, and she indignantly declined. He eventually made good, but considered that the loss of prestige which he sustained through this occurrence cost him more than a delay of several weeks in opening would have done. The necessity for observing such things is shown by the fact that a business man with no knowledge of photography can start studios and build up a large trade by employing operators, while a clever photographer may wait in vain for sitters.

There are many factors in making a business which may be classed under the heading of advertising. The premises themselves are the first. When Mr. Selfridge came to London to start a drapery business in competition with the most celebrated firms in the trade, he did not take the first commonplace looking building which would have provided the necessary accommodation, but erected a building of unique design in the position which he considered the most suitable. We cannot all do this, but where it is a question of choosing between convenient premises of poor appearance and situation and those which are less convenient but in a position likely to attract custom I should unhesitatingly choose the latter. We can, with a little ingenuity, rig up an unsuitable place, but we cannot get people to go a step out of their way until a very good reputation has been established for the business.

The next important factor is an attractive series of specimens in styles which can be supplied without modification or delay. A photographer cannot show samples of his work in the newspaper advertisements, so that the least he can do is to show them on his premises, and, in addition, in as many showcases as can be placed in eligible positions. Railway stations have long been popular for this purpose, and deserve their popularity, for people waiting for trains have time to look at the show, and if the case is clean and bright there will usually be spectators in front of it. The choice of platform is important. In most stations the departure side for the largest town is the best, as people have usually to wait for trains to arrive; when they get to their own station they lose no time in getting away. Booking office positions are of little value, as people do not linger there. I have found showcases at local post offices and hairdressers to yield a good return, and for exhibiting these the proprietors will usually accept payment in kind. Wherever the cases may be, they

should be well cared for, and the specimens changed frequently, or they will cease to attract attention unless in an undesirable way.

Much has been said and written as to the value of circular or personal letters addressed to former sitters and other desirable folk, but their value depends much upon local conditions. It is doubtless a good plan to keep in touch with those who have already patronised the studio, but letters to strangers are usually connected with free-sitting offers, and I advise that this class of business be left alone. A well-known photographer who had gone in for it extensively said to me: "For twenty years I have been spending thirteen pence to get a shilling without knowing it." People do not value what they can get for nothing unless they are of a certain class who will take all they can get on the cheap, and those who intend to pay for photographs prefer to go where they fancy the work. One of the most progressive and prosperous men in the trade never gives a free sitting even to popular actresses, and gets as much business at good prices as he can deal with. As a contrast to this I can instance a case where a photographer agreed to take free a hundred sitters from a Government department for a presentation album, trusting to re-orders to recoup himself. The amount of these was £4! The publicity gained in this way does not seem to be worth much, the only exception perhaps being in favour of the local papers, where an occasional paragraph can be obtained in return for services rendered. Newspaper advertising is expensive, and, as far as I have found, gives a poor return, although if paragraphs can be inserted, at advertisement rates, referring to any recent achievements, such as photographing the mayor or local M.P., or any local event, it will usually be worth while.

In small towns much may be done to promote business by personal action, such as taking part in any popular movement, serving on committees, joining any suitable societies, and in every way showing activity and business ability. People will then realise that you are one of the institutions of the place, and come to you as a matter of course. Although most photographers do not realise it, the friendship of local amateurs is worth cultivating. These folk can seldom take a decent portrait, and are more likely to send their families to a man who sympathises with them than to one who has given them a snub.

The best advertisement of all is a satisfied customer, and if you ask many people how they get their sitters they will say, "By recommendation"; and there is no easier or better way when this can be done. To do it requires much tact, for one dissatisfied sitter will do more harm than half a dozen satisfied ones will do good. It is not so much a question of the quality of the work as of treatment. If there is any question of a re-sitting it is wise to give in gracefully, and not to let the party go away with a feeling that he or she has been harshly dealt with. People who are habitual "kickers" must be dealt with firmly but courteously. Their word, as a rule, does not carry much weight, as their own friends know that they are never satisfied; but even they should not have to complain of rudeness.

A modest piece of advertising which is usually remunerative consists in the distribution of small calendars bearing a specimen photograph of a child, dog, or other attractive subject. The calendars can be purchased very cheaply, and the prints made and mounted at odd times.

There is nothing very novel in the foregoing remarks, but as they are the result of personal experiences of my own, and close observation of the doings of others, I trust that they will be of some value to those who have to make a start without skilled advice. Always keep your performances up to your advertised promises. I remember one firm which put up a big sign which read: "What we say we do, we do do." This is an excellent sentiment to live up to; unfortunately the firm who put it forth did not justify their slogan, and soon closed down. Nothing, perhaps, is more resented by people than failure to keep promises.

PRACTICUS.

THE DEVELOPMENT OF BRITISH LENSES FOR AIRCRAFT PHOTOGRAPHY.

[The third of the papers contributed to the Royal Photographic Society and reprinted from the Society's "Journal" is that setting forth the share taken in the provision of lenses for aerial photography by the Birmingham firm of Messrs. Aldis Bros. That Messrs. Aldis were not longer and more largely associated with the supply of this optical munition of war was no fault of theirs. The resources of their factory, as will be seen from the paper, were taxed to the utmost in the manufacture of certain other equally essential optical instruments.—EDS. "B.J."]

The representative of Messrs. Aldis, owing to a series of railway mishaps, was unable to reach the Royal Photographic Society in time to read the paper by his firm. The text of the paper is as follows:—

One of the most interesting, and from an industrial point of view one of the most healthy, effects of war on industry is the way in which it stimulates rapid adaptation to quite new conditions of manufacture. In the early stages of the war the firm of Aldis Brothers found itself suddenly forced to concentrate entirely on the production of telescopic rifle sights for snipers. This was due to the fact that our firm was one of the first to submit a model to the War Office which entirely satisfied all their requirements. The demand was so great at the time that once the firm's capacity had been proved as regards optical design the Ministry of Munitions made it their business to see that *all* the resources of the firm were concentrated on working up the largest possible output of that one optical munition. Thus, at the very outset of the war the firm found themselves *wholly abandoning* photographic lenses. One factor influencing the situation, of course, was that the only pre-war Aldis series of lenses of sufficient rapidity for aircraft photography had not at that time been established in long enough focal lengths to be really suitable for the work.

The demand for the Aldis telescopic rifle sight was fairly at its zenith when there was a great scare at the front due to the Germans jamming our wireless messages from aeroplanes. An official at the War Office had read a pamphlet written by A. C. W. Aldis on "Electric Projectors," and in consequence the firm was asked to report on the possibility of establishing a portable daylight signal lamp for use to and from aeroplanes, so as to provide a second string to wireless.

The firm attacked this problem with such zeal that in the end the Aldis daylight signal lamp for aeroplanes was designed and submitted, and the success of this invention seemed to throw further and further into the background the possibility of our ever touching photographic lenses during the war.

It then became the understood thing for the aircraft people to take all electric projection problems to Aldis Brothers, and a great variety of landing lights and portable searchlights were designed for use on aircraft. A great deal of this work

was design pure and simple, the firm having nothing to do with manufacture as soon as models had been passed as satisfactory.

In 1916 the firm submitted the first Aldis unit sight for aiming machine-guns on aeroplanes, and the enormous success which this ultimately attained soon put the Aldis telescopic rifle sight in the shade; in fact, early in 1917 we were *again* in the unfortunate position of having produced an invention which it was quite impossible for us to produce in sufficient quantities. We were obliged to organise production on a large scale in two other factories, and by this, and by making considerable extensions to our own works as well, the demand was ultimately met to the entire satisfaction of the Ministry of Munitions.

During all this time the ever-increasing popularity of the Aldis daylight signal lamp taxed the firm's resources to the utmost. Manufacture was established in other works of everything except the very special optical sight, which we alone could produce. Everything we had designed was wanted in quantities not only larger than we could produce, but apparently larger than we could get produced.

It will be therefore readily understood that when a representative of the Photographic Section of the Royal Air Force called at Aldis Brothers' towards the end of 1917 and requested us to take up the manufacture of large photographic lenses, he was received not altogether with open arms. The firm was working up to the limit of its then capacity, and in addition had mortgaged its extensions then being erected, to increase the deliveries of unit sights in response to the continual demands made upon it. However, the R.A.F. representative, after much exercise of his considerable powers of persuasion, was not at all pleased to receive a blank *non possumus*.

The firm consented to take the photographic lens up only after continual repetition of the following sort of argument: "Mr. Aldis, you were manufacturers of photographic lenses before the war; photographic lenses are wanted now in ever-increasing quantities, and the other sources of supply are working at maximum capacity; you were manufacturers of photographic lenses before the war; you must and shall supply us with photographic lenses now."

At last we agreed to consider the production of aircraft anastigmats, whereupon the representative of the R.A.F. produced a captured Zeiss lens, of aperture *f*/4.8 and 20-in. focal length. He said: "This is the sort of thing we want, but there are two difficulties about copying it exactly: one is that these precise types of glass are not in the list of British glass-makers, and have to be obtained from France, and the other is that neither in this country nor in France are slabs of this size and quality to be obtained in sufficient quantity to meet the demand. We are therefore prepared to take a smaller aperture lens, say *f*/5.6, of the same focal length."

Aldis Brothers' reply was first to get into touch with Messrs. Chance in the matter and review the question as to the supply of large circular slabs of highest quality glass supplied in considerable numbers. They reported that they were able to supply a large quantity of discs large enough for the *f*/5.6 lens, *provided we took glass of their then established types*, also later on they could supply smaller quantities of discs for much larger lenses. This glass was quite as good as the German glass in the Zeiss lens, but it was *very distinctly different*. This entirely precluded any question of merely copying the captured lens, which line of attack incidentally Aldis Brothers were fully determined to have nothing whatever to do with. The firm then applied to the R.A.F. authorities for *permission* to design and manufacture the best possible photographic lens of the focus and aperture required, and covering the specified plate, *but the glass to be of British make*. This permission the R.A.F. granted, albeit with misgiving on the part of the higher authorities, who still had grave fears that after all the German-designed article made of French glass *could not help* being superior to anything of purely British origin.

The lens was calculated, trial models were made, and finally the first lens was sent off in trial mount on New Year's Eve, 1917. We are able to produce this trial lens. The Photo-Section was enthusiastic about it, and informed us that, over the plate we had been asked to cover, it was proved to be *superior to the German article*. Contracts were placed for the lens, and supplies of the purely British article were forthcoming in considerable quantities. The other lens shown herewith is one which has done good work, but has received a bullet in the middle. The glasses are undamaged, and it will take an excellent photograph, but the centring has been slightly impaired.

Bearing in mind the promise of Messrs. Chance to supply slabs of much larger sizes, two fresh designs were put in hand. One of these was a 36-in. *f*/6 to cover a 10 ins. by 8 ins. plate with critical definition. This huge lens we are enabled to show by the courtesy of the R.A.F. authorities and Mr. C. Houghton. One of the first duties it was destined for was the examination of Zeebrugge, where the anti-aircraft organisation was troublesomely effective, and photography was done from such heights as three miles.

The second lens put in hand was one of 20 in. focus working at *f*/4. This was also made of entirely English glass, though another type of flint was used. It was designed to cover a 10 by 8 plate, as in the meantime the British standard plate had been increased to this size to come into line with the Americans and other Allies. We are able to show herewith the trial lens, which was very favourably reported on. At the same time the standard 20-in. *f*/5.6 was also modified for use with the 10 by 8 plate.

All these lenses are of the *triplet* type. This type of lens is one which has a very great deal to be said for it, though, of course, every type of lens manufactured has its strong points. These very long focus aircraft photographic lenses are naturally used on quite a narrow angle. They also tend to be quite long in the barrel, partly for this reason, and as a consequence the curves are shallow compared with the ordinary terrestrial photographic lens. As a result, when the corrections of the lens have been worked out fully, the quality of the definition is amazingly good compared with the terrestrial lens, in spite of the fact that the image is on so much larger a scale. A series of test charts which the R.A.F. authorities have very kindly permitted us to show to-night will enable anyone to see at a glance the microscopic definition which the Flying Corps demand and the lenses afford.

It was found in practice that trouble, when it arose in testing these lenses, was due (after the initial stages) not to deficiencies on the part of the workmen—only old and experienced hands worked on these lenses, and seemed to succeed very well in turning out the very best work—nor to deficiencies in design or in the construction of the metal work, but in those minute variations in the refractive index and homogeneity generally which are the more liable to occur the larger the lens. This was in spite of the fact that Messrs. Chance instituted a rigorous testing of every single slab supplied by means of the interferometer, and that the quality of these discs was undoubtedly maintained very high.

The telephoto type of lens was given very serious consideration, but abandoned. This type of lens for long focus aerial work has undoubtedly a great deal to be said for it, and it has found particular favour with certain of our Allies. It permits of a short camera, and this with a long focus lens in an aeroplane is really very important, as otherwise the lens or camera or both may project from the fuselage and slow the aeroplane; also the lens is the better for being well

shielded. The angle of view included is, generally speaking, within the limits that the type of lens is capable of, though it often approaches those limits.

The reasons Aldis Brothers had for not adopting the telephoto type were practical and cogent. First, it is very subject to pincushion distortion, and this, which does no harm when photographing sporting events and the like, is a serious handicap for map work. Secondly, it is, compared with the triplet, *expensive in glass.* This is very bad in war-time, because the shortage of raw material always tended to be more serious than the shortage of skilled labour. Clearly it can hardly consist of less than four glasses, and may include five or more, and these glasses are rather thick. Admitted that those forming the back negative lens are smaller than the others, yet it is undeniable that, compared with the simple triplet, they do demand a lot of glass. It will be remembered that when the firm undertook the manufacture of large photographic lenses the heavy demand for these was accompanied by serious misgivings as to the quantity of first-class optical glass in large slabs which could be made available.

Furthermore, it is distinctly doubtful whether the telephoto lens at its very best will ever quite attain to the high standard of definition afforded by the triplet lens at its very best. It is, however, to be expected that when glass supplies become more normal and designs of such lenses progress, their use will be relatively on a more extended scale than was possible during the war.

It may be of interest to mention the time taken to calculate a large photographic lens. During the purely calculating stages two computors working side by side under supervision of the head designer may work steadily on for three months before models are put in hand. When models begin to be made the number of these may be as many as eight, if the lens is of new type, or only one if we are working on lines in which we have much experience. The time of making a model, of examining it, and of carrying out the calculations which ensue before the next model is put in hand is about three weeks. When the lens has been got right it will take a considerable time to prepare all the spherical tools for the working of the different surfaces.

It may be interesting to mention that a certain amount of trouble arose with these lenses owing to the fact that their focal length was actually comparable with any terrestrial distance which was available.

Ordinary photographic lenses are tested with an "artificial star" at a distance of between 60 and 70 ft.: this for the ordinary camera lens is *further off* than the point usually described as "infinity," but it is quite a different matter with a lens of 36 in. focus. This with a 60 ft. star is racked out beyond its infinity focus very nearly 2 ins. The furthest sharp-cut terrestrial object available was a flagstaff half a mile away, which meant racking past infinity something like .04 in.—quite an appreciable distance at *f*/5.6 with microscopic definition. As regards celestial objects, these are only seen at night, and to use a real star would be quite possible, but hardly compatible with factory conditions.

The lenses are mounted in a special form of mount to go into the standard aeroplane cameras. They screw into a standard flange in which the mount can be locked in any position within the limits of an inch or more. This is for focussing—that is to say, to take up slight differences in focal length, due as much as anything to slight differences between the optical constants of one slab and another. Variations of ¼ in. either way in a 20-in. lens do occur, and are not readily preventable in quantity production.

The mounting is such that glasses cannot readily be taken out. Aeroplanes do come to grief, from quite a lot of possible causes, and valuable stuff can be salvaged off them. The souvenir craze is quite bad enough to cause a Tommy to march off with the front glass only of a valuable anastigmat in his pocket—a criminally wasteful proceeding when the anastigmat is undamaged. Even when one glass is broken or the lens mount smashed up it is quite feasible to have these replaced and made up with the undamaged elements into a new lens.

The mount, therefore, is designed not to be readily taken to pieces without tools, and yet so that with simple tools and the requisite knowledge every surface of every glass can be cleaned without removing the mount body from the camera or disturbing the focus adjustment.

No iris diaphragm is fitted to these large lenses. The definition is so good that stopping down does not improve it, and anything in hand in the matter of plate speed is at once taken up by using a deeper light filter. As everything is at infinity there is no "depth of focus" problem.

As regards weight, it may be interesting to mention that the 20-in. *f*/5.6 lens, including flange, but without screen and screen cell, weighs 5½ lbs., of which the lenses account for just over 1½ lbs. Corresponding figures for the 20-in. *f*/4 are 10 lbs. and 4 lbs., and for the 36-in. *f*/6 are 16¾ lbs. and 7 lbs.

For these long focus lenses and great heights of flying, light-filters are indispensable to cut out the effect of the selective absorption of the atmosphere. The nature of the dyestuffs in these filters is a study in itself, but as Messrs. Wratten and Wainwright, in their book, "Orthochromatic Filters," point out, the *optical* properties of filters need careful attention. A little thought will show that except for their being flat rather than spherical, the quality of the optical work and the homogeneity of the glass in the filters must be maintained to exactly the same standard as in the glasses of the anastigmat itself. In point of fact, the two flats between which the filters are cemented are very carefully made, and are distinctly expensive. Such a filter as the one for the 36-in. *f*/6, for instance, consists of two glasses each 6⅝ in. diameter and ⅜ in. thick, each weighing ½ lb.

The filters go into cells fitted on to the front of the lens. These slip over the mount and are retained by a bayonet fitting, standardised so that any mounted filter will go straight away on to any lens of corresponding size.

CONCERNING TONE VALUES.

[Tonality as the property of a photograph, and particularly of a portrait photograph, is perhaps the quality in respect of which the constant progress of photographic art will exhibit its chief development. Photographers within the last decade or so have come to a much fuller understanding of the amenities which a portrait should display in the matter of composition. But after all composition is only one of the things which contributes to the making of a work of art, and therefore we quote from our contemporary, the "Photographic Journal of America" some notes which very usefully lay emphasis on the laws, so far as they can be formulated, which relate to this all-important matter of "tone."—Eds. "B.J."]

Tone, in an art sense, should not be construed by the professional photographer to mean colour. We have for years past used the word in defining the colour of our prints, such as the blue, purple, olive, black, or sepia tone, etc., but this relates to the results produced by our chemicals. Artists frequently use the word in the same sense as we do, enlarging its scope by various other expressions, such as "cool," "warm," or "rich" tones; but when they so express themselves it is evident to those with whom they

converse that they refer either to the colour tone which prevails throughout, or to the strength or depth of this colour.

Now, while admitting that the word "tone" is thus used by artists, as exemplifying a principle in pictorial art, it is understood by them to mean at least two other things.

1. Atmosphere Tone.

The obtaining of an effect over the whole picture, similar to what would be produced if we were to interpose a transparent and meshless veil of harmonious tint before the picture, through which the light would pass as through an atmosphere. It may very easily be imagined that this would result in bringing all parts of the picture into harmony, by placing in their proper planes of attractiveness, etc., all the colours, lights and shades, perspective, and the various values. This we will designate as "atmosphere tone."

2. Light Tone.

Tone is also understood as meaning the gradations of the light falling upon the objects painted or photographed in various degrees of intensity; the gradations of chiaroscura, or light and shade. This we will call "light tone."

We will comment but little upon "colour tone," most familiar to photographers by long usage, except to state the well-known fact that many false tones are apparent at times in our printed-out papers, where the faces, hands, and other masses of white are not of the same colour or tone as the shadows, etc. Since our various paper demonstrators have for years, at our conventions and in our studios, touched upon a solution of this matter, it is unnecessary for the writer to go further into a subject so well understood by us all.

The "tone" produced, illustrated by the interposition of a veil, as descriptive of a certain effect which we wished to describe, and the "light and shade tone" afterward mentioned, will form the subject of our further remarks on the subject of tone, as more nearly coming within the exact meaning of the term in a pictorial sense. We shall refer to them irrespective of any further classification or intent of separation.

"Light tones" may be further defined as meaning the harmonious blending, by gradation, of all the lights into the darks, in their proper degree of shade. In other words, the gradation of the multitude of little lights and darks to their adjacent parts; of the larger masses of various degrees of light and dark to each other, and then, in turn, of every part to the whole. The result as a whole may be light, medium, or low in key, and yet be in tone.

Tonality.

Unity of tone by gradation may be present in certain parts of the picture and absent elsewhere. When it envelops the whole picture like an atmosphere (which under certain conditions is easily and charmingly produced in a landscape), then such a picture is complete in tone in all its parts: its "tonality is good."

Improved tonality in portraiture may be obtained by placing the subject away from strong light, as when working for colour values. This causes the light and shade that fall upon the sitter, and other parts of the composition, to easily fall into any degree of gradation that the pictorialist may desire: i.e., slight changes will often be found necessary to keep these gradations in harmony. For instance, he hardly expects that the chair as first placed is exactly where he will wish it in the final composition. He must judge the effect of colour values as well as the ultimate pitch of the key in tone.

Pictorial workers often describe this placing of the subjects in a suitable location in the room as "bringing them in tone," "arranging the composition in tone," "placing them where they will be in tone," etc.

The distinctions between various principles are sometimes very slight, especially so in monochrome work, and all effect toward the attainment of one materially aids the successful accomplishment of others.

Tone Improperly Rendered.

Pictures may be out of tone in some of their parts, although in good order elsewhere, simply because the parts do not pull together or harmonise with the rest. It may be that certain places are too white, such as the face, hands, collar, cuffs, etc. These, on account of their startling appearance (due to "forcing" forward by too strong lighting or other causes), appear to "jump at you." Remedy: In lighting the composition throw more shade on these places.

It may be that other parts, not quite so prominent, perhaps, but in greater number, are at fault. These impress you as disturbing the harmony of the composition by their distracting assertiveness. Remedy: Throw more shade on these parts. If in background, place it farther away from the direct light. If in accessories, remove them from the picture if possible.

In the earlier papers of this series we have frequently referred to the importance of making various elements that enter into the picture take their proper positions in attractiveness. The less important must not interfere with the concentration of interest upon the most important, which in most pictures is the face. We also have mentioned that if any be unduly prominent they should be subordinated, their attractiveness lessened, either by lighting (if discovered in season), in development, or by the knife afterward. It is here that the ambitious student, in his attempt to improve a faulty piece, by partial or total elimination, should be on his guard. He must see to it that the work be not overdone, and that by toning down, because too bright or objectionable, it is not made too dark.

Pictures in Low Tones.

In making pictures in low tone, great care is necessary that the tone be rich and full, in default of which only muddy, black, and heavy prints will be the result. Accented lights will help to overcome these muddy tones, if used with care, so that texture and tonality are preserved.

Bear in mind that even the shadows, to say nothing of other dark parts of a low-tone picture, produce muddy effects unless gradation is present, excepting in a few of the very deepest shadows. This was the trouble with our earlier efforts in low-tone work, and still continues in the majority of the black backgrounds, in pictures made to-day, constituting a mass of gloom—unfeeling, unintelligent, and overpowering in effect. Put some life into the background, if only by flowing the back of the negative with ground-glass substitute and, with a tuft of cotton and yellow ochre, very slightly working-in larger or smaller masses so that, even while still dark, they will lessen the gloom by a semblance at least of gradation.

Rich Low-Tone Pictures.

A rich effect in low-tone work is obtained by avoiding monotony. This is to be guarded against in work photographed in any key. This is accomplished by seeing to it that some parts of the ground or figure are more highly lighted than others. To avoid "spottiness" these higher lights should be massed, not of necessity over large areas, but enough to balance the picture without attracting too much attention. A little goes a long way. Richness is increased by a repetition of this scheme in some other part of the picture. It makes the whole piece a little more lively, aiding contrast, while enriching the shadows in which, as above said, some gradation is necessary to prevent muddiness.

The character of these masses, if obtained with the lighting, is largely governed by their own shape or form, which in itself adds interest. If obtained by working on the negative, then do not overlook the importance of making these worked-in masses of lighter key, interesting in their shape, in some such way as to suggest a form that is not symmetrical, for symmetry is decidedly objectionable in art. Also have the character of the masses, if more than one be employed, dissimilar.

Pictures in a Light Key.

Avoid a continual and unceasing gradation in "light" (and shade) tone, throughout the whole picture, when in a high key, for in this case, as with low tones, the results will be tame and monotonous.

In these "keyed-up" pictures have the light and shade a little more marked and snappy, at the same time being careful that it is not out of harmony in tonality. This art principle serves well as a brake to check a too liberal application of this suggestion. As in the case with low-tone work, it also produces variety and creates interest. Locate these enlivening tones of light and dark in various parts of the picture to produce richness.

The writer saw a reproduction of a very delicate painting in

decidedly high key, a group of fair children against a light background. The spots of dark were introduced at different parts of the picture by two dark-haired children, and a fairly strong shadow at another place. Result was beautiful. These dark masses were responsible for the success of the picture; on covering them the piece was insipid. When, however, a mass of dark cannot well be inserted in pictures of lighter key, it is sometimes advisable to introduce gradation to prevent flatness.

In pictures in the lighter keys the range of light values very often does not give a contrast of more than 15 to 35 per cent. out of a possible 100. The result, therefore, is more liable to be flat than when the range of contrast is greater, although not heavy, dark, and forbidding, as in pictures of the opposite key. For this reason it seems that a continual gradation throughout all parts of these pictures with little contrast should be striven against.

Breadth, in connection with tonality, the elimination of non-essentials, etc., is always desirable. Directions in arrangement and lighting (the beauty of simplicity), added to the elimination of unnecessary detail, flat shadows, and broad effects of light and shade, will do much toward making a success out of what otherwise would be a flat failure. This, in photographic art, appears to be the highest attainment in the production of high-keyed pictures.

The reader should not think that because I have advocated striving to produce the luminosity of colour values, and gradation of tone values, that I have here contradicted myself in advocating a practical disregard of some of these principles in pictures of the lighter key with slight contrasts. Even if my recommendation be accepted, it does not follow that values of all kinds are to be disregarded. On the contrary, some cases may call for even a greater amount of care that these principles be not disregarded.

Art does not require that every principle known to it should be employed to its extreme extent in all instances. It is all a matter of choosing the "handling" or treatment best suited for certain effects, and the producer of pictures by the lens should be able and resourceful in quickly determining how best to handle these various conditions as they arise.

Rules there are none in art, in the strict sense of the word. Certain rules have been proved to be good under certain conditions; yet even these have been broken and masterpieces have resulted from their breaking. Discrimination and judgment are left for the artist to employ. The study of correct "handling" is what he requires. He sometimes succeeds under certain conditions by violating principles which under other conditions it would be imperatively necessary for him to follow.

PROFESSIONAL.

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Applications, April 28 to May 3:—

PRINTING.—No. 10,946. Photographic printing apparatus. C. Haig.

MOUNTS.—No. 10,574. Mount for passe-partout framing of pictures and photographs. I. Joseph.

COLOUR PHOTOGRAPHY.—No. 10,831. Plates for making photographs in colours. E. H. Tarlton.

AERIAL PHOTOGRAPHY.—No. 10,956. Apparatus for maintaining a camera vertical in aircraft, and apparatus for registering angle at which a photograph is taken. A. Fawcett.

CINEMATOGRAPHY.—No. 10,729. Cinematograph apparatus. C. Bancarel.

CINEMATOGRAPHY.—No. 11,110. Cinematograph shutters. J. Crooks.

COMPLETE SPECIFICATIONS ACCEPTED,

These specifications are obtainable, price 6d. each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

ROLL-FILM CAMERAS.—No. 124,545 (June 13, 1918). The invention relates to roll-film cameras, and has for its object to provide improved means for operating the pins which hold the film-carrying rollers in position in the camera, the means being capable of instant operation to bring the pins into their service and out-of-service positions.

The invention comprises the arrangement of the reel pins carried by the camera, so that they are adapted to be pressed into their operative positions (in which they enter the holes provided in the film-roller ends) against the action of a spring or springs and to be retained in such positions by catch pieces or their equivalents, with means for releasing the catch pieces, so that the reel pins are withdrawn by their springs clear of the film rollers.

As shown in the drawings, there are provided two movable reel

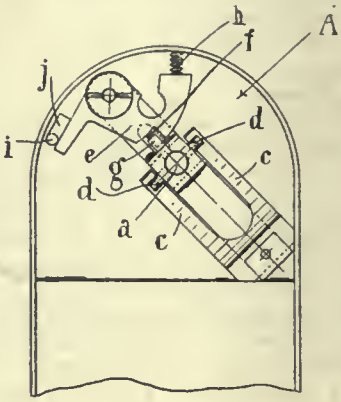


Fig. 1.

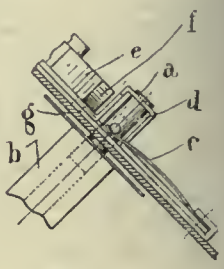


Fig. 2.

pins *a* for each film roller *b*, each reel pin *a* being normally held by a spring *c* acting on the cross pin *d* in its out-of-service position clear of the holes in the film roller *b*, so that the latter can be withdrawn from position and a new one inserted. The reel pins are moved into their service position by the application of pressure to their outer ends and are retained in such position by catch pieces *e*, each having a bevelled or inclined portion *f* upon which bears the pin *g* in each reel pin *a* when the latter is pressed inwards, so that the catch piece is forced outwards until the pin *g* passes beneath the catch piece, when the latter springs back into position over the pin *g* under the influence of the spring *h*. In fig. 2 the pin *g* is shown held beneath the catch *e*, and in fig. 3 it is shown clear of the catch. In the latter figure, the reel pin mechanism for the left hand end of the film roller is omitted, as it is a duplicate of that at the other end. The two catch pieces

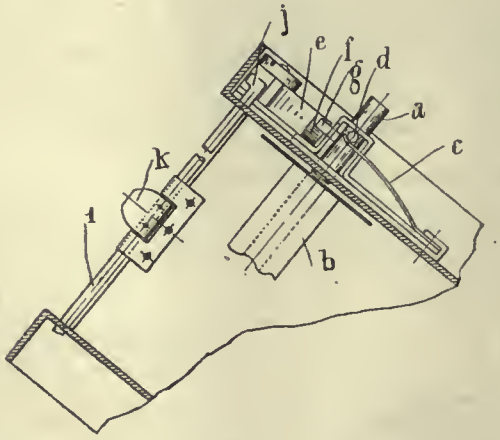


Fig. 3.

may be operated simultaneously by movement of the inter-connecting spindle *i* having cranked ends *j* which engage the catches. The pressure of the finger on the tongue *k* on the spindle *i* turns the catches until they release the pins *g*, which then allow the reel pins to move outwards.

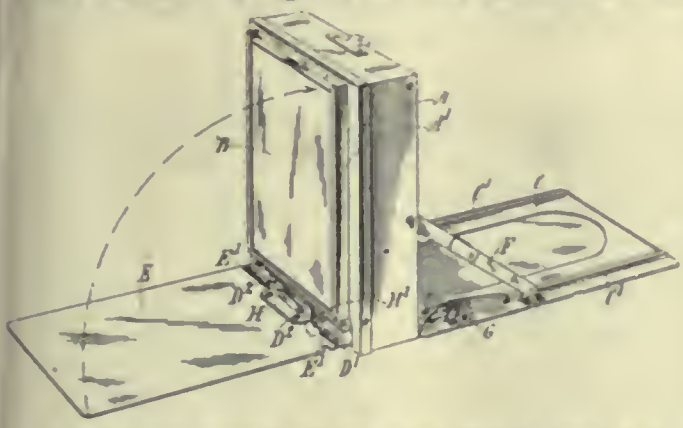
The improved arrangement may be applied to the reel pin which acts as the film winder, such pin and the corresponding one at the other end of the film reel being adapted, if desired,

for simultaneous release in the manner before described. Or the reel pin to which the film winder is attached may be an ordinary pin held in engagement with the film winding on roller by spring pressure, and the pin for the other end of the roller may be arranged in accordance with my invention, the catch being released by the pressure of the finger thereon. Samuel Poole Twemlow, Springfield, Sandbach, Cheshire.

FOLDING CAMERAS.—No. 124,636 (May 30, 1918). The invention is for improvements in or relating to cameras, and is particularly suitable for application to pocket cameras, though it is not restricted to these. According to the invention, the camera, having a base which folds up over the front, is characterised by the sliding front having a tail-board hinged to it, so arranged that when the front is pushed forward the tail-board engages the guide in the base, but when it is pushed back the tail-board extends out behind the body of the camera, and can be folded up against the back of the same.

Preferably the guides on the base are continued on the bottom of the main frame, to which the base is hinged, and the tail-board engages this portion of the guides as well as that on the base, and thus constitutes a strut between the base and the main frame, whereby the base is held rigidly in the extended position when the front of the camera is advanced.

The camera body comprises the usual rectangular frame A, having guides A' at the back to receive a dark slide B, and a baseboard C, which is folded over the front of the frame when the sliding front has been pushed in and the bellows collapsed. The baseboard C is hinged to the bottom member of the frame



A in the usual manner, and has guides C' on its upper face, in which slide the ends of the base D' of the sliding front. Other similar guides are provided on the bottom member of the frame A in alignment with the guides C'. The guided portions of the base of the front are longer than usual as compared with the thickness of the camera when closed, owing to the guided portions extending beyond the frame when the camera is closed. Hinged at E' to the back of the front is a relatively long tail-board E, which is also shaped to engage and slide in the guides C' on the base C. This tail-board E is of the same length as the camera back, and folds up behind the dark slide or the means for carrying the same at the back.

In operation, the baseboard C is first swung down as usual, and may be checked by any convenient butting means or by the usual folding strut F. The tail-board E is then folded down and pushed towards the baseboard, which automatically advances the front of the camera and extends the bellows, and the continued forward movement causes the tail-board to enter the guides in the body of the camera, and then also the guides C' on the baseboard C. The tail-board E thus bridges the hinge connecting the baseboard C to the body A of the camera, and provides a rigid connection between these two parts, so that the side strut or other means for limiting the downward movement of the base can be dispensed with if desired, though it is convenient to have something to arrest the downward movement of the baseboard whilst bringing the tail-board into position.

A spring detent G, mounted on the baseboard C, is provided to arrest the forward movement of the front at the position for normal focussing. In this position the detent G takes into a notch cut in the side of the tail-board E.

To prevent the tail-board E from falling below the horizontal position when it is folded down it is provided with a catch H, having fingers H', which project forward when the tail-board is in the horizontal position, and extend through and abut against upturned lugs D², carried by the base of the camera front to which the baseboard is hinged. The camera made as described may be of metal, and of such size as to go into the pocket, or it may be larger, and made of other substances according to requirements. Newton and Wright, Limited, 72, Wigmore Street, London, W.1; and Thomas Litchfield, 43, Lambton Road, Hornsey Rise, London, N.19.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

TUESDAY, MAY 20.

Royal Photographic Society.—Lantern Evening. "The Home of the Rajput." E. W. Mellor.

Hackney Photographic Society.—Slide Competition: A Beach Scene.

Manchester Amateur Photographic Society. — "A Comparison of Developing Agents." R. E. Crowther.

Chelsea Photographic Society.—Portfolio. 1917 Affiliation Competition Prints.

WEDNESDAY, MAY 21.

Croydon Camera Club.—"A Few Simple Experiments." Rev. F. C. Lambert, M.A.

THURSDAY, MAY 22.

Tunbridge Wells Amateur Photographic Association.—"The Evolution of Our Local Scenery." H. E. Turner, B.A., B.Sc.

Hampshire House Photographic Society. "Exposure." J. O. Abrahams.

ROYAL PHOTOGRAPHIC SOCIETY.

MEETING held Tuesday, May 13, Mr. W. B. Ferguson, K.C., in the chair.

Mr. W. C. Mann, chemist to Messrs. Thos. Illingworth and Co., read a paper on "Development Papers and Desensitisers"—that is to say, on the maker's problem of avoiding the effects arising from particles in the base paper having a desensitising action on the emulsion, and thus causing white spots in prints. He dealt very candidly with the difficulties which makers of development papers had had to encounter owing to the disturbance in the supply of raw paper-base. While particles of almost any heavy metal exerted a desensitising action on the emulsion, the most commonly occurring metals were iron and copper, the latter of much rarer occurrence than the former. Iron, however, according to the measurements of Mees and Shepnard, was twenty times as active as copper.

Tests for iron particles were made with either ferrocyanide or ferricyanide, that with a mixture of ferricyanide and nitric acid being most usually employed. A very delicate test consisted in the application to the raw base paper of an acid developer, such as formerly used for P.O.P., with addition of a little silver nitrate.

Emulsions, he continued, varied greatly in their susceptibility to desensitisation by metallic particles, and the thickness and suitability of the baryta coating in the paper base were further factors. It was, however, possible to employ anti-desensitisers. Substances acting in this way were mannite and quinine. A considerable quantity of such anti-desensitiser required to be used in order to overcome the action of a possible maximum of desensitiser in every small area of the paper base; but by suitable choice of emulsion, baryta coat, and anti-sensitiser he had been able to produce quite faultless development paper with raw base which otherwise would have been completely unusable. He exhibited test pieces showing the complete freedom from white spots of developed prints on paper which yielded a large crop of iron spots under the ferricyanide test.

A short discussion followed, in which Mr. F. F. Renwick, Dr. R. E. Slade and the chairman took part.

On the proposition of the chairman, a hearty vote of thanks was accorded to the lecturer for his paper.

CROYDON CAMERA CLUB.

Attracted by an advertisement announcing that a society had been formed "for the scientific investigation of those results going by the name of 'psychic' or 'spirit photographs,'" the hon. sec. of the club, Mr. Sellors, immediately shadowed the hon. sec., Mr. F. Barlow, of the Psychic Society, who, not without difficulty, kindly arranged for last week's fixture.

To a crowded house Mr. James Wates, Ph.D., F.A.S., gave a

lecture on "Psychic Photography," illustrated by a large number of slides.

Now, a good deal might be said on a very interesting lecture, but a whisper from Wellington Street puts any account out of court, or into the editorial waste-paper basket, which amounts to the same thing. The decision appears to be wise, for a nodding acquaintance with psychics or spiritualism extending over a long period, indicates that any discussion on the subject is usually utterly fatuous, and contentious matter would be bound to be introduced into any report of the proceedings (very much so).

In further justification, let some points of view now held, seventy years after the birth of spiritualism as known to-day, be impartially enumerated. The sound, commonsense individual without examination dismisses the whole thing in light and airy fashion—"bally rot." Others brought into contact with it find this attitude impossible, and admit some phenomena, which they consider proved, as inexplicable, but deny any justification for the claim to the supernatural. In addition, many regard much which has been associated with, or appropriated by spiritualists, as tending to establish a morbid, but little understood, condition of the mind, and strongly advise avoidance of the subject by all. They further point out that practically nothing is known regarding the mind, and what is inexplicable to-day may be better understood to-morrow.

Ranged on the other side is a fairly large number who sincerely believe the various manifestations are of spiritual origin, and have adopted spiritualism as a quasi-religion, rejoicing in being able to penetrate beyond the veil, and perhaps communicate with loved and lost ones, the great human desire of all times. Counterblasts proceed from not a few of the orthodox, who allege that communication is established only with evil elements masquerading as benign, and they draw an obvious moral. Others, adopting a more neutral attitude, saying neither yea nor nay, affirm that not one jot of knowledge concerning the conditions existing beyond this life has ever been revealed, and sadly point out, assuming spiritualism to be true, then good-bye to the idea that the hereafter is on a higher plane than the present. Altogether quite a nice collection of asserted opinions and beliefs, which might still further be extended.

It may be permitted to add that a discussion followed the lecture, which was accorded a most hearty vote of thanks. Visitors from all parts were present, and appeared to be keenly interested. During the evening the secretary announced that the price of spirits had been advanced by one penny.

CATALOGUES AND TRADE NOTICES.

Messrs. F. Brodrick, Ltd., 50, High Street, Charing Cross Road, London, W.C.2, send us their catalogue of their own special manufactures for professional photographers, among which is the drying machine which we recently noticed, developing and fixing tanks, enlarging easels and printing appliances, as well as the various patterns of the very well designed display tables and stands.

Kodak Price Lists.—Messrs. Kodak, Ltd., Kingsway, London, W.C.2, have just issued two small price lists, suitable for distribution by dealers. One is of Kodak and Brownie cameras and accessories; the other of Preme, Graflex and Cirkut cameras. Dealers who may chance not to have seen these lists will do well to apply for them to the Kodak Company as a means of furthering sales during the present season.

Commercial & Legal Intelligence.

Eastman Kodak Company.—In addition to the usual quarterly dividends of 1½ per cent. (being at the rate of 6 per cent. per annum) upon the outstanding preferred stock, and of 2½ per cent. (being at the rate of 10 per cent. per annum) upon the outstanding common stock, the directors of the Eastman Kodak Company have declared an extra dividend of 7½ per cent. upon the common stock—all payable on July 1—to stockholders of record on May 31.

Importation of Picture Postcards.—The importation of picture postcards, which has hitherto been dealt with by the Department of Import Restrictions, will henceforth be dealt with by the Department of the Controller of Paper (Board of Trade), 23, Buckingham Gate, S.W.1, to whom applications for licences should in future be sent.

News and Notes.

Fire at a Studio.—There was a serious outbreak of fire on the night of Saturday, May 10, at 11.39 p.m., at Bayley's Studios, Ltd., photographers, 16, Tottenham Court Road, W., as the result of a carelessly thrown down light. A back room on the second floor used as a workroom and the contents were damaged, whilst the rest of the floor of two rooms and the contents were damaged by heat and smoke.

Mr. H. C. Messer, of Castle Street, Salisbury, has supplied to the Mayor of that town enlarged photographs, which the latter is presenting as a record of two events connected with the war. One photograph represents the celebration of Empire Day, 1918, by a large body of British and Colonial troops in the Market Square, Salisbury. The other is a group of the local repatriated prisoners of war. The enlargements, which measure about 6 ft. by 3 ft., have been on exhibition at Mr. Messer's studios.

Correspondence.

**** Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

**** We do not undertake responsibility for the opinions expressed by our correspondents.*

REVERSAL IN TANK DEVELOPMENT.

To the Editors.

Gentlemen,—We recently developed a batch of eighty dozen half-plates, all outdoor subjects. The plates all went through the same developer in our developing tanks, which are made to hold ten dozen plates. All the plates were developed satisfactorily except twenty-five plates. These came up positives instead of negatives, as the enclosed rough print will show. The plates appear to be slightly fogged, but on a suitable card would give good prints provided they had been negatives instead of positives. Is it possible to say how the plates came to be positives? In the case of a subsequent, also recent, lot of plates, some have turned positives instead of negatives. Out of a batch of eighty dozen half plates two dozen have come up positives and the rest are quite all right. They were all developed in exactly the same way, and, as far as we can see, there should be no reason why all the plates should not be all right. The most peculiar part about it is that one plate had been divided so that two exposures could be taken on the same plate. One half of this plate was a negative and the other part was a positive. Could this have happened in any way owing to the plate being fogged in the camera?—Yours faithfully,

W. Binns.

Hollinroyd, Bispham, Blackpool.

[We shall be glad to hear if any user of tank development for large batches has had a similar experience. We can find no explanation of Mr. Binns's very remarkable result.—Eds. "B.J."]

REPRODUCTION FEES FOR PRESS PHOTOGRAPHERS

To the Editors.

Gentlemen,—It is certainly time that the present reproduction fee was increased.

London Press agencies are getting an increased fee, not per picture, but a bonus on the invoice.

If "Press Photographer" will join the Proprietors' Association of Press Photographic Agencies, 46, Fleet Street, E.C.4, he may also receive a bonus.—Yours truly,

"Newspaper."

NEW SIZES OF SMALL CAMERAS AND PLATES.

To the Editors.

Gentlemen,—With reference to the announcement, "Quarter-plates to go," in your issue of 25th ult., I would like to add a few remarks to "Old Hand's" letter in your issue of 2nd inst. I am a colonial born of British parents, and am over here on military duty. I would like to point out that many of our men from overseas have purchased valuable cameras, amongst which are many fine quarter-

plate cameras. I myself purchased one valued at £25, also a quarter-plate enlarger valued at about £8. Now, Gentlemen, it is a fairly well-known fact by many tradespeople in this country who have had dealings with our soldiers that if the average colonial wants a thing he will have it, and no association is going to compel him to scrap his camera if he can get the plates and paper he requires.

If the British Photographic Manufacturers' Association will not supply him with the plates and papers, then don't blame the colonial if he secures his requirements from America or any other country. If such countries find the supplying of such articles will lead to trading in other photographic material there will be no difficulty in obtaining them. The Dominion to which I belong, and hope to return to, for years was flooded with German goods, and, unless Great Britain awakes to the fact, other countries will capture Germany's lost trade. Before it is too late, let the B.P.M.s' Association reconsider their decision to rule out the quarter-plate. Also it would be well for British manufacturers to have better control over the retail price of goods in the colonies. Why cannot the manufacturers have a stated retail price for material for sale in the colonies, making allowance for custom duties, cost of transit etc. It matters little to the average tradesman who sells the article whether it be of British or any other make, so long as he obtains his profit.

See to it, Mother Country, you supply your children in the colonies with the things they require, and at a fair and reasonable price; otherwise you will drive them to seek other trading fields. To lose the colonial trade may eventually lead to the loss of the colonies.—Yours faithfully,

"A Dominionite."

To the Editors.

Gentlemen,—The attention of this Association has been drawn to the letters appearing in your issues of May 2 and 9 on the subject of the new standard plate sizes, and I have been requested by my council to draw your attention to the fact that your correspondents have evidently misunderstood the intentions of the Association in this matter.

First of all I would point out that there is no idea whatever of withdrawing from the market any of the old sizes of plates, such as the ¼-plate size, which will all continue to be manufactured by the plate manufacturers so long as they are in demand, and that as far as the camera makers are concerned, it is not even their intention to discontinue the manufacture of their present model cameras in the old recognised sizes, such as ¼-plate, but only when introducing new models to make them in the new four standard sizes in preference to any other sizes.

In fairness to the plate manufacturers I would further state that this is a question which has been raised entirely by the camera manufacturers, in order to reduce as far as possible the enormous variety of sizes in which cameras now have to be made, so that they may be produced on a quantity production basis of manufacture and thus be sold at the lowest possible prices consistent with the type of article. This standardisation of sizes, which it is intended as far as possible shall apply all over the world, is surely not only in the interests of the manufacturers themselves, but also in the interests of all camera users, as under present circumstances an Englishman travelling on the Continent or, say, in South America with a camera of English manufacture has the greatest possible difficulty in obtaining supplies of plates that will fit his camera, and the same thing applies to a foreigner, from any country where Continental size plates are in use, travelling in Great Britain or in any country where English sizes are the most popular.

Standardisation all over the world also carries the advantage to the manufacturer that instead of having to make two cameras of almost identical size (viz., the English and Continental corresponding sizes), he will only have to make one model which will be suitable for all foreign markets, and thus enable him to secure at least a fair share of the trade which before the war went largely to Germany.

It must also be borne in mind that the demand of recent years by photographers for cameras giving a picture of the oblong shape, which is certainly more pictorial than the old square-shaped ¼-plate, has very greatly increased, and although this is not nearly such a serious matter as the other questions referred to above, it surely is the correct thing for the English manufacturers to cater for what is in demand rather than to endeavour to keep to the old conservative attitude of the Englishman of never making a change if it were possible to avoid doing so.

If your correspondents will refer to the Association's letter which you published upon this subject, they will at once see that, although camera makers are requested to make all their *new* models in the four standard sizes it is proposed to adopt, in preference to the old sizes, yet there is no idea of creating such a situation as your correspondents seem to fear—viz., that the cameras they now possess may become obsolete and useless.—Yours faithfully,

Arthur C. Brookes, Secretary.
British Photographic Manufacturers' Association.

May 14.

MONOMET-HYDROQUINONE DEVELOPER.

To the Editors.

Gentlemen,—Many formulæ of the developer monomet-hydroquinone have been given in the "B.J.," but none have been given as to the time it takes to give a plate of the same density as when the same quantity of metol-hydroquinone was used.

Prior to the war I was fond of using the Ilford formula for metol-hydroquinone:—

Metol	30 grs.
Hydroquinone	45 grs.
Potass metabisulphite	45 grs
Water	10 ozs
Sodium sulphite	1 oz.
Sodium carbonate	1 oz.
Water	10 ozs.

For use I took 1 oz. of each and added the same quantity of water. At the temperature of 80 deg. F. I noticed that it took 2½ minutes to develop a plate properly. Metol being dear, I reduced the quantity by one-third and increased the hydroquinone similarly. I noticed that it took 3 minutes instead of 2½ to develop a plate up to the density I required, and, what was more, I found that the developer was particularly good for the Paget bromide paper.

Not being able to obtain metol a couple of years ago, I was offered "Monomet." I used the same formula, substituting it for metol, and developed for three minutes, but to my surprise I found that my negatives were very dense. I made some experiments by diluting the developer. I found that to obtain the same density as would be given by my old developer, I had to dilute with 2½ ozs. of water for every 1½ oz. of the Monomet-hydroquinone developer instead of 1½ oz. of water with the metol-hydroquinone. Thus it will be seen that the ratio of the strength of Monomet to metol is five to three

My present formula is:—

A. Monomet	20 grs.
Hydroquinone	60 grs.
Potass metabisulphite	80 grs
Water	10 ozs.
B. Sodium sulphite	1 oz.
Sodium carbonate	1 oz.
Water	10 ozs.

The above can be made up into a single solution developer, it does not care for two solutions, and keeps well. For use I take ¾ oz. of A, ¾ oz. of B, and add 2½ ozs. of water and a few drops of 10 per cent. solution potass bromide, and develop for three minutes at 80 deg. F.. For bromide paper, I prefer to dilute with an equal quantity of water, and develop for one minute.

Hoping that some of your readers may profit from the above.—I remain, yours faithfully,

Tan Hock Ann.

Treasury, Penang, Straits Settlements, April 2, 1919.

FORTHCOMING EXHIBITIONS.

April 17 to May 22.—Hammersmith Hampshire House Photographic Society Annual Exhibition. Two open classes. Joint secretaries, J. G. Abrahams, 41, Hamilton Terrace, London, N.W.8; A. H. Page, 12, Lime Grove, London, W.12.

September 13 to October 11.—London Salon of Photography. Entries close September 2. Hon. sec., 5a, Pall Mall East, London, 1

Answers to Correspondents.

SPECIAL NOTICE.

In consequence of general reduced supplies of paper, as the result of prohibition of the importation of much wood pulp and grass, a smaller space will be available until further notice for replies to correspondents.

Moreover, we will answer by post if stamped and addressed envelope is enclosed for reply: 5-cent. International Coupon, from readers abroad.

The full questions and answers will be printed only in the case of inquiries of general interest.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

L. T.—We take it that you did not supply any photographs at all, not that you supplied one that was unsatisfactory. In this case, there can be no doubt at all that the sitter can legally demand the money to be returned.

G. B. B.—The London address of the Bausch and Lomb Optical Company is 37-38, Hatton Garden, London, E.C., but most probably they would not care to take on a little job of this kind, and you would want to go to an apparatus repairer such as Messrs. H. T. Ball and Co., 51, Berwick Street, Oxford Street, London, W.

N. E.—We think it is pretty clear from what you say that by suing Mrs. L. in the county court you would get your charges, and she would have to pay costs. Obviously, by offering you a sum of money she has admitted the debt, and therefore it would not be necessary to establish the fact whether she had ordered the work or not; it would merely be necessary to establish what your charges were for the three prints, which, we take it, is what you want to do. No doubt if you have a solicitor's letter sent to Mrs. L., pointing out that she has no defence if it came into the county court, she will readily pay the amount and the solicitor's costs.

B. E.—Motor vehicles photographed out of doors call for a quite different lens from one suitable for interiors and workshops. For the former you want as long a focal length as you can afford, in order to make a distant standpoint for the camera and so avoid exaggeration of the size of the bonnet in comparison with the size of the body. A 20-in. lens is none too long for a 12 x 10 plate for this purpose. No need to have an anastigmat, an $f/8$ R.R. is all you want. For interiors and workshops we advise an $f/6$ anastigmat of from 10 to 12-in. focal length if you are confined to one lens, but if you can run to two, you had better get a wide-angle for this size of plate of about 8- to 9-in. focus, and one of, say, 12 or 14-in. for general work, the latter might be an $f/6$ anastigmat, but an $f/8$ R.R. would be very nearly as good.

O. N.—1. It is advisable to apply for one. The address for your district is Iddesleigh Mansions, London, S.W.1. 2. No, except on stationery and mounts. But you will require to register the business under the Business Names Act. The fee is five shillings. If you cannot obtain the necessary forms from your local post office, you can get them from the Registrar of Business Names, 39, Russell Square, London, W.C. 3. At least four 1,000 c.p. Six would be better. 4. In a curve between 7 and 8 ft. from floor extending from centre of front of background 8 ft. from it to 5 ft. from edge of background. We should advise a thin calico diffuser. 5. "The Studio and What to Do in It," by H. P. Robinson (Iliffe, 3s. 6d.). No book obtainable on posing. Our publishers supply a small manual on sketch portraiture, by J. S. Adamson, price 8d., post free.

E. M.—The cause of the pinkish stains is probably insufficient citrate in the toner. Perhaps you have not the right quality of citrate. At any rate, it is evident that you want more of it. Papers vary in this respect, and unfortunately one cannot compare those of the present time with pre-war qualities, on which the formula was based. We can give no explanation of the irregularities of toning, but think perhaps they are not thoroughly fixed (in two baths in succession), and washed for half an hour or so in five-minute changes. The Ferguson process is quite a reliable one. The only alternative for red tones is to sulphide tone in the usual way, and then to treat the prints in a gold-sulphocyanide toning bath, as used for P.O.P. Messrs. Wellington, who have advocated this method for a long time, give some instructions in their handbook.

A. H.—2. If you are enlarging to large size, say 20 by 16 and over, and may be working from dense negatives, you had better have a small arc lamp, a very good model of which is supplied by the Westminster Engineering Company, Victoria Road, Willesden Junction, London, N.W., very widely used for enlarging, and as good as any you can have. 3. Impossible to say, as it depends solely on the scale on which you are enlarging. For a half-plate negative you would want a lens of about 9 in. focal length, and you can reckon the space required in front of the enlarger by roughly taking it that for every degree of linear enlargement you will want 9 inches. Thus, if you are enlarging four times, you will require three feet space in front of the enlarger. Really you require to allow also about another foot. 4. As good as anything is an R.R. lens of about 9 in. focus. 5. As regards the camera, if you are taking single portraits with plenty of space, a half-plate lens of about 9 in. focus will answer quite well for the small sizes, but if you are taking anything else in confined situations, you will want lenses of correspondingly wider angle—that is to say, a lens of which the focus should be a little longer than the long side of the plate. 6. It all depends on the space you have available. If ample space, you can; if the space is prescribed you will want different foci. See table in the "B.J. Almanac," which will tell you exactly what you can do. 7. Yes, certainly. For copies on to half-plates, 9 in. lens will do very well indeed, or any R.R. lens; for small plates, of focus about 1 in. or so longer than the long side of the plate. Extension of camera should be at least double the focal length of the lens, unless you want to make enlarged copies in the camera, in which case it must be a good deal more.

The British Journal of Photography.

Line Advertisements.

Charges for Insertion.

Since advertisements cannot be inserted until fully and correctly prepaid, senders of line announcements are asked to bear in mind the scale of charges. They will thus save themselves delay in the publication of their announcements. A Schedule by which an advertisement can be correctly priced will be sent on request.

Net Prepaid Line Advertisements.

12 words or less	1/-
Extra words	1d. per word.

(No reduction for a series.)

Special Note. Box Number Advertisements.

"Box No." and office address	charged as 6 words.
For forwarding replies add ...	6d. per insertion for each adv't.

If replies are called for this latter charge is not made.

Advertisements cannot be inserted until fully and correctly prepaid.

Orders to repeat an advertisement must be accompanied by the advertisement as previously printed.

Advertisements are not accepted over the telephone or by telegram.

The latest time for receiving small line advertisements is 12 o'clock (noon) on Wednesdays for the current week's issue.

Displayed Adv'ts should reach the Publishers on Monday morning.

The insertion of an Advertisement in any definite issue cannot be guaranteed.

HENRY GREENWOOD & CO., Ltd., Publishers, 24, Wellington Street, Strand, LONDON, W.C. 2.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3081. Vol. LXVI. FRIDAY, MAY 23, 1919. Price Twopence.

Contents.

	Page
Ex Cathedra	273
The Two Ways	274
Fourteen Points on Colour. By A. Vernon Godbold	275
Photographs as Evidence. By La Verne T. Ryder	276
Practicus in the Studio. By Practicus	278
Some Tests of the Action of a Shutter of the Focal-Plane Type. By M. Equer and E. Cousin	280
A Table for P.O.P. Toning	283
British Photographic Materials and Foreign Markets	283
Patent News	283
Catalogues and Trade Notices	284
Meetings of Societies	284
Commercial and Legal Intelligence	285
News and Notes	286
Correspondence— Reversal in Tank Development	287
Forthcoming Exhibitions	287
Answers to Correspondents	287

SUMMARY.

In his article this week "Practicus" deals with mounts and mounting, discussing the artistic choice of mounting papers, as regards tone and colour, and the practical measures of trimming and mounting by both the dry and wet methods. (P. 278.)

The requirements needing to be fulfilled in photographs taken for the purposes of evidence in law courts are the subject of an article by a legal photographer which we quote from "Photo Era." (P. 276.)

MM. Equer and Cousin, of the French Photographic Society, have made a series of measurements of the variation in speed of a focal-plane shutter over different parts of the plate. The variations disclosed are considerable. (P. 280.)

In a leading article we seek to set forth some of the causes created by the war period which may have their effect upon the photographic portrait business, and more particularly upon studio operators not in business for themselves. (P. 274.)

In the course of the concluding portion of his article on colour Mr. A. Vernon Godbold has some practical hints to give. (P. 275.)

A table of the quantities of toning bath to be used for various numbers of different sized prints has been published by Messrs. Rajar, Limited. (P. 283.)

A Swiss correspondent sends us some notes on the opportunities for trade in British photographic materials in his country. (P. 283.)

Major Lawe, of the Photographic Section, R.A.F., is to read a paper on aerial photography before the R.P.S. on June 3. (P. 286.)

We are glad to be able to say that steps have been taken to prohibit the importation of German cameras by officers in the Army of Occupation. (P. 274.)

The question of applying for a charter of incorporation was discussed at the last council meeting of the Professional Photographers' Association. (P. 284.)

Mr. George Hana, ex-President of the P.P.A., has had to undergo a serious operation, and is progressing well. (P. 286.)

According to an American journal, a photographic method of recording wireless messages has been successfully worked out by an American engineer. (P. 287.)

A correspondent of the "Pharmaceutical Journal" has recommended a solution of quinine in alcohol as a plate backing. (P. 286.)

The mineral naphtha used in denaturing spirit is no doubt a cause of scummy deposits on negatives additional to lime salts in the film as a result of washing in water containing them. (P. 273.)

EX CATHEDRA.

Colonial. On behalf of our publishers, we must ask intending advertisers in the forthcoming Colonial and Foreign Number of June 6 to note that the last day for the receipt of display advertisements, and for the alteration of copy in standing advertisements, is Thursday, next, May 29. The volume of advertising matter in this number is such that an earlier closing of its pages, so far as displayed advertisements are concerned, is imperative, and advertisers will very greatly facilitate the convenience of our publishers in getting out the issue if they will give their orders and supply copy at the earliest moment within the next few days. The dates for the receipt of small prepaid, undisplayed advertisements remain as usual, that is to say, they can be accepted up to noon on Wednesday, June 4, but here again, in view of the great bulk of the issue, it is even less possible than ordinarily to guarantee their appearance. It is advised that such small advertisements should reach our publishers not later than Monday or Tuesday, June 2 or 3.

* * *

Spirit Drying. The paper by M. L. P. Clerc, which appeared in the "British Journal" of last week, is a valuable contribution to the cause of one of the minor troubles in photographic processes. While M. Clerc's experiments make it abundantly clear that the presence of lime salts in the film of a negative or print, due to saturation by lime containing water, is the cause of white markings, it may nevertheless be thought that lime in the water is not the whole cause of the whitish deposit which is liable to occur in drying plates or prints with spirit. The mineral addition which is made in denaturing spirit is a cause of the milkiness which is produced when such spirit is diluted with water, and we think there is no reason to doubt that part of the whitish scum which is produced in drying negatives with methylated spirit arises from this cause. Probably it differs from the lime deposit in being largely superficial whilst the latter extends through the substance of the film. Gentle abrasion of the dried negative surface by preparations such as Baskett's reducer or Vanguard "Frictol" will easily remove such superficial deposit, though it will not touch any precipitated lime salts in the film itself. The behaviour of a negative under this treatment will, therefore, give some clue as to the cause of the deposit. Incidentally, M. Clerc's measurements of the number of prints which can be dried under various specified modes of treatment in a given quantity of spirit emphasise the very great economy resulting from draining water from the prints before immersion in the spirit, and of draining spirit from them after immersion. Blotting or squeegeeing of the prints would show still better

results. The figures mark the considerable amount of liquid which is retained by a print but can be readily removed by simple mechanical means. It will be remembered that many years ago MM. Lumière showed the advantage of the same principle in washing prints.

* * *

Import Regulations. A memorandum of the Board of Trade, issued on Wednesday in last week, contains a list of a considerable number of classes of goods, restrictions on the importation of which are to be removed. Among photographic requisites the order refers to the following:—Ferrotype plates, camera shutters, positive papers, and cinematograph cameras. Presumably "ferrotype plates" refers to the polished plates employed for squeegeeing, although it may be interpreted as applying to the sensitive plates used in ferrotype cameras, of which formerly there was importation on a considerable scale. The removal of restrictions on the importation of shutters will undoubtedly be welcomed by the camera-making trade, but it is doubtful if the same feeling will extend to the unrestricted introduction of positive papers by the makers thereof, whose costs at the present time are probably much in excess of those of American manufacturers. It is possible that the effect of the Order may be a fall in the prices of printing papers. Cameras fitted with lenses are to be imported under licence only exceptionally as and when required, but all other photographic apparatus, with the exception of that already mentioned, is to be admitted at the rate of one-third of the 1913 importations in proportionate quarterly amounts.

* * *

No Cameras from the Rhine. We are glad to see in our contemporary the "Photographic Dealer" that steps have been taken to put a stop to the offering for sale in London of cameras bought from the German dealers by officers of the Army of Occupation. The question was raised in the House of Commons by Lieut.-Col. Moore-Brabazon, and though Mr. Churchill made a very unsatisfactory reply, it now appears that he took steps, on particulars given to him, to request the military authorities on the Rhine to put a stop to this trading with the enemy. Mr. Arthur Brookes at the Photographic Dealers' Association mentioned a case of an officer who had been prevented from bringing a camera purchased from the Germans back with him to England, so it seems that the traffic will cease or, at any rate, be reduced to quite negligible proportions. We are glad to hear from several dealers in second-hand apparatus that they will buy no more of these cameras, and we can assure them that we shall take every precaution to prevent their being offered for sale in our advertisement pages.

* * *

New Standard Small Sizes. The letter from the British Photographic Manufacturers' Association, published in our last issue, effectively answers recent correspondents who professed to discover in the earlier announcement of the Association the desire to victimise plate users for the benefit of the makers. On the face of it, such an interpretation was absurd, for where a large number of cameras of a given size exists it is obviously to the plate-maker's interest to supply plates for them, and anybody who knows anything of the present position in the camera-making trade appreciates the fact that camera-makers have good reason not to concur in a policy which will render existing cameras obsolete. As we pointed out at the time, the change is plainly one which must take place gradually, and we now have it from the Association that the transition will be rendered still slower by the fact that camera-makers will continue to manufacture present models of apparatus in the old sizes, and are asked to adopt the new only in the case of fresh patterns of camera. Anyone who read the original announcement carefully should have been under no misapprehension, but the Association's letter usefully emphasises some of the advantages which in time will result from its policy.

* * *

Focal-plane Shutters. The paper by MM. Equer and Cousin, communicated to the French Photographic Society, which we print on another page, is an interesting contribution to the technics of the focal-plane shutter, although the measurements were made of a type of shutter quite unfamiliar to us in this country in which the slit forms part of a rigid plate instead of a flexible blind. The effect of mass in causing acceleration of the slit as it travels downwards from top to bottom of the plate is one which theoretically, of course, applies also to a flexible blind, although we should expect to find that its influence would be small in comparison with the fairly constant friction existing during the simultaneous uncoiling and coiling of the blind. It may be hoped that MM. Equer and Cousin will carry out their experiments on commercial patterns of focal-plane shutters of the roller-blind type.

THE TWO WAYS.

We were reminded the other day of the directions in which the business of portrait photography has moved during the last few years by coming across a leading article*, which reviewed the situation and apparent tendencies at that time. Then, as now, portrait photography included within itself the so-called "high-class" and "cheap" businesses. But the latter particularly were of a somewhat different kind. The establishment producing portraits at exceedingly low prices was then only in its initial state of development, for the most part producing the small portraits sold as "sticky-backs"; and very largely an element in the business was its peripatetic character. It was assumed, and then no doubt quite rightly, that the local demand for portraits of this kind was soon satisfied, so that having exhausted the custom of one large town the people in the business would carry their not very elaborate equipment to another. At that time, too, we had another kind of cheap photographer, the amateur-professional, or "backyard" man, engaged during the week in his ordinary occupation and making a business in his leisure of such portraiture as was within his capacity, and for which he could find a market only on account of the small price he charged for it. Fortunately, the development of the legitimate cheap portrait business has gone a very long way towards extinguishing his kind. In this glance backward it is instructive to note that along with the increase in cheap photography there has been, as we ventured in the article to predict that there would be, at least a corresponding development in the high-class studio. The interval has witnessed the arrival of some men who have come to take a front-rank position as photographic portraitists, although they entered the business altogether without a preliminary training in the ordinary studio. Their work has achieved success entirely on its merits, and has not been without its effect upon those who previously sought to cater for the most cultivated class of customer.

So much for the immediate past. What of the future? Let us say at once that we do not take a pessimistic view of the prospects of the photographic portrait business even in the years of war-aftermath which are opening. Perhaps at no time during the last half century has it been

*"Under which King, Bezonian." "B. J.," Jan. 25, 1907, p. 59.

less easy to forecast the outlook for a business like photography under the exceptional conditions which have been created by nearly five years of war, and, still more, industrial dislocation. We are living in a time of flux where forces are in operation greater perhaps than any which have moved in England since the Civil War. Industrial magnates who expected to end their days plain commoners sit in the House of Lords! Mr. Smillie catechises ducal landowners; Royalty goes slumming, and Labour leaders are called in for conference on high matters of State. Nevertheless, amid the cross currents of such a moving time certain elements can be discovered which have a bearing upon the prosperity or otherwise of the photographic portrait business. One of these is the immense advertisement which photography, by its service to the Army, has received. The mere fact that photographs taken from the air are the means of saving thousands of lives gives an added status to a photograph as such. We may not be able to analyse the mental process, but we can recognise the conclusion. Then photography has been enlisted to show the public at home what war is like. The many war exhibitions of photographs in London and throughout the country have rather overshadowed, in this field, the arts of the painter and draughtsman, from whose work in the past the public has formed its impressions of warfare. Then it has to be remembered that the putting of millions of men into uniform and sending them overseas has provided among the masses of the public the frequent occasion to visit the photographer's; the same thing applies to the multitudes of W.A.A.C.S., W.R.E.N.S., and W.R.A.F.S. recruited during the latter phase of the war. The stimulus thus applied to the wish to have a photograph taken has been a far greater factor in bringing photography and the people *en masse* together than even the scheme of "Snapshots from Home," which worked in a different sphere. Concurrently, too, with these influences is the greater distribution of money among labour. The thirty millions which the miners have added to their wages will be spent on photographs among other things. A greater expenditure on articles which hitherto have been regarded as more or less luxuries is to be looked for among the working classes.

Thus, while we are very far from thinking that there is to be a lesser demand for portraits of the highest artistic excellence such as are represented by the work of our leading men, we think we foresee a greater and greater patronage of the studios catering for popular tastes at a popular price. It is in reference to this tendency in photographic portraiture that the photographer, be he proprietor or operator, whose work falls into the category of "good average middle-class" needs to revise his ideas. He may, and in our experience very often does, despise the cheap work. We think he fails to recognise that the cheap work is constantly improving in quality, that at the present time a fair proportion of it is very good, and is cheap for the reason that its production is organised upon business lines to which many a photographer of the passing generation is a stranger. It is not easy to specify with anything like exactness the personal and technical qualifications which make the average portrait photographer. Largely he is born of an interest in the technical processes, negative-making, printing, and the like, has some aspirations after art though little appreciation of its essentials, and next to no training in it. Add to these a business instinct, which varies greatly among individuals but in many cases is not highly developed, and you have perhaps a rough picture of the general type of photographer—one who loves his occupation for its own sake and is averse from having it divided off into watertight compartments like a well-organised factory. Nevertheless, to a very large measure we stand, so we think, at the present day at the parting of the ways, in one direction along a path which is highly individualistic and offers success only to the man of genuine artistic capacity; in the other, along well-planned commercial lines designed for the cheap and efficient production of portraits the quality of which will improve as time goes on and will become such, even if it is not so now, as will satisfy a large proportion of the customers to be found in the middle classes. A consideration of these present-day tendencies is perhaps more important to the photographer seeking employment as a studio operator than to men in business for themselves in towns of small or moderate size, where their customers are those of the more or less well-to-do middle-class. The employee, and at the present time many are would-be employees, needs to consider that the field for him in the future may lie in the cheap portrait studio; the smaller proprietor is fortunately in the position that he does not rely solely upon portraiture for his takings, but obtains a substantial proportion of his income from work done away from the studio, and often including much of what is generally called "commercial photography." We venture to suggest that it is to his interest to cultivate this branch of work by all the means which are available to him. As we have often said during the past three or four years, we think there is great scope still for photography in this field, and that altogether the prospect for photography in these changing times is not one to discourage any of those connected with it so long as the possible and probable outcome of the forces at work is recognised.

FOURTEEN POINTS ON COLOUR.

(*Continued from page* 262.)

Perfectly transparent colours are too powerful, sometimes look quite sickly, especially if yellow; therefore always use a little body colour in your backgrounds to give atmosphere to keep them from coming forward, as it is unlawful to suffocate people. The most suitable colours are the neutral tints like gray, brown, delicate pink, olive, russet or citrine. These also go well with any mass of black. For vignetted backgrounds:—

Blue gray shaded with brown.
Green shaded with burnt sienna.
Neutral tint shaded with yellow or green.
Olive green shaded with brown.

9. Flesh is best represented by simple tints nicely gradated and not broken up. A patchy juxtaposition of primary colours is all very well for small miniatures, but is not suitable for colouring a photograph of medium size. If the colour of the face is too brilliant it will lack refinement, and if beauty is lacking a nice quality of colour will give it charm. When Reynolds, speaking of colour, told his students to think of a peach, he meant the direct condition of flesh was peach-bloom, surroundings cruder, and lips as compared with dry-bricks to look like fruit; therefore he very pithily described what he aimed at himself. Do not be afraid to colour the ears with a little red to keep them back and force the nose forward; don't get them purple, as this will give them a frozen appearance. The eyes and mouth have the most colour, then the cheeks; keep the colour clean, avoid hot foxy colour, leather colour and fever colour. Don't forget a soldier looks ridiculous with a

lady's complexion. Course brushwork on the face always makes the flesh look like a sheet of crumpled notepaper. Use a white enamel or china palette, so that the transparent and semi-transparent tints can be better seen.

10. Now to a question of a little reform as a means of bringing about better results and a better reputation for coloured photographs. One of Whistler's propositions was that a work of art should be "finished" from the beginning. This is well understood by operators as regards B. and W., but colour is always an afterthought, an afterwish by the patron, whereas good work can only be done by making it a forethought. It is suggested for studios to announce special sittings for colour arrangements—no extra expense, merely the use of a panchromatic plate, some forethought and advice. Costly curtains and screens such as Royal Academy artists favour are not advocated. Procedure after this style: A lady takes advantage of the studio's announcement for a colour sitting, and is dressed in blue; a background is let down, preferably of a panelled room; she is posed removing a plate of oranges from a table. That picture would lend itself to colour.

The present method is something like this: A lady in furs wishes for a standing position, and is taken against a landscape that happens to be down. The picture is passable in B. and W., the lady likes the expression, an enlargement is ordered to be coloured. The result unfortunate, because the colour emphasises the landscape.

A lady is taken in evening dress against a strong cloudy background. It looks very well in B. and W.—an order is given for one coloured. The colour of the clouds translated by the artist as a storm makes the lady look foolish.

Much can be done by painting in and painting out, but if a coloured photograph is to show a nice clean, even finish and surface and general craftsmanship it must be finished from the beginning. Ladies love a change of dress, whether it really suits them or not. It may happen a woman of forty, with a sallow complexion, in a blue blouse, has a sitting, afterwards asking for a coloured enlargement. She gives the colours; her friends know that particular blouse is blue, and blue it's made. The result is cruel, because the blue intensifies her yellow face. If forethought was colour and the artist is consulted he will probably discover by conversation that the lady had at home a more suitable dress of yellow-brown and a string of yellow beads—an easier picture to colour with satisfaction all round. The same consideration should be for children; and how pleased parents are if the child makes a picture, more so if colour can be effectively applied.

11. Until the great need for the standardisation of the terms describing the quality of colours is filled, and an accurate system of colour notation is invented the artist must see the sitter. Where this is brought about a great difference will be seen in the truth of colour recorded; and if an artist is not on the premises the occasional artist should be in attendance by appointment. It used to be quite an event in olden times to have one's portrait recorded in colour, and why not to-day?

A special fee will have to be charged to meet the time taken up, but the result will be worth it. The plain man in the street can see the difference between Bond Street work and the product of the "Whitechapel gentleman" when the two are together, although he does not know why.

12. If Whistler had run a studio he would have announced:

Maker of Portraits.
Projected Pictures.
Symphonies in Silver-grey and Black.
Harmonies in Golden Brown.
Colour Arrangements by Appointment.
Silhouettes in Nocturne Tints.

And would have displayed his "projects" after the manner of high-class studios of to-day, displaying just one or two coloured specimens as something choice, which is far more effective than the shops that crowd coloured enlargements into their windows like the unloading sale of a picture factory.

13. Tinting vignettes in various colours in the same way as cream toning is done by the hypo-bath is suggested. Whistler selected coloured papers for his pastels, not to avoid "fatiguing the paper," as he put it, but that a fine effect could be got by easy means. For instance, a few touches of scarlet on blue-green paper is a most striking harmony. Suppose the aim is to make an enlargement from a vignetted head and shoulders of Marshal Foch as an attraction for the window. The artist proceeds to make the print himself, to save time afterwards, as few printers can make a soft vignette. Then by means of the hypo-bath he tints the paper or takes the print out of the bath and sponges it over with a dye of soft blue-grey, then leaves it to be washed and mounted in the usual way. The face is coloured by the oil, wax or pastel method; the gold braid and Army ribbons touched in. It will be seen by getting rid of the surrounding whiteness which is so common, and adding a tint the touches of colour tell like jewels, and have quite a different appearance to the usual dust cloud raised by the airbrush. A girl in a green dress would have a green-grey ground tint similarly with other subjects.

14. Colour will be wanted to liven the display and to give variety if the suggestion of local exhibitions for professionals is carried out—what Whistler would call "an heroic kick" to improve business, a stimulant to good work, a counter-attack to the canvassing tout. With a couple of borrowed war photographs in colour to help the attraction the public would remember for a long while where to go for good work. Photographers would meet as in the market-place, and other benefits would accrue.

A. Vernon Godbold.

PHOTOGRAPHS AS EVIDENCE.

[The use of photographs in legal actions, not simply for the purpose of illustrating and facilitating the evidence of witnesses, but in providing evidence of a different kind, is viewed with more favour in American Courts than in those of this country in which the judicial mind, so we think, is less open to the acceptance of fresh practice. Therefore, in reprinting the following very practical notes on legal photography from our Boston contemporary, the "Photo Era," we should make it clear that we do so, not with the idea of suggesting a remunerative branch of business to photographers, but by way of adding, on however small a scale, to the weight of testimony in favour of the qualification of the photograph to have its place in providing evidence which may often be more reliable than that of the human witness.—Eds. "B.J."]

The value of photographs as a means to bring the scenes, surroundings, and conditions that existed at the time of a crime to the direct attention of a jury seems to have been overlooked in many cases by the lawyer and the photographer. I believe that this is due to two reasons: first, the lack—on the lawyer's part—of knowledge of the value of photographs as evidence; and, second, to the lawyer's inability to obtain the services of a photographer who really understands how to photograph so that his prints may be admitted as evidence. I have made a careful study of this branch of photographic work for ten years, and I will endeavour to explain some of the details of the requirements to make a photograph of legal

value in a case. I have had my photographs introduced as evidence in many kinds of cases covering accident, damage, attempt to defraud, larceny, and murder. I will give a few cases to show how very helpful and important photographs proved to be in establishing certain legal points.

There are some things with regard to the camera which will be understood by the photographer, but not by the lawyer. For this reason, I have made it a practice to have a "get-together" meeting, with the photographer and the lawyer as the interested co-workers. At such a meeting both can come to an understanding as to what is necessary to make a photograph of value, and what questions can be used to ensure the photographs being admitted to the court-proceedings; or, in some cases, what questions can be used in the cross-examination to cause the "other side's" photographs to be disqualified.

There are, I find, eleven important points to remember with regard to using the camera which, in my opinion, are absolutely necessary. Although these are by no means all that are necessary to bear in mind, they will cover automatically all other questions that may be brought up in the Court. By following closely the points that I will try to give, the photographer may be very sure—in fact positively certain—that nothing can or will be brought out in the cross-examination which will cause the Court to rule against his photographs.

Nothing of Importance can be Changed in the Scene.

That is, the negatives should be made as soon as possible, so that everything at the scene of the crime may remain exactly as it was at the time. If, however, considerable time must—for some reason—elapse before the negatives can be made, the photographer must be able to swear that nothing which has any bearing on the case has been changed. This is the reason that I have made a practice to keep a camera with plates and accessories that I may need—including flash-pan and powder, fifty-foot tape and compass—all packed in carrying-cases, ready for immediate use, either day or night.

Angle of View as that of the Eye.

It is very important that the lens should include about the same angle as the eye, for either an increased or decreased angle will tend to change the relation of objects shown in the picture. Now the average angle of the human eye is thirty-five degrees, so that for a 7 x 5 plate one will need a lens of 11 ins. focal length—this will give thirty-five to thirty-six degrees; on a 8½ x 6½ plate a 13 in. lens will give one thirty-five to thirty-six degrees, and on a 10 x 8 plate a 16 in. lens will give thirty-five to thirty-six degrees. Here, let me say that I have found the 10 x 8 print, linen-mounted, to be the best for all-round Court work, as it is large enough to bring out fine detail clearly, and is not too large to be handled easily.

Camera must be Level.

It is absolutely necessary that the camera be level, as a slight tilt will give vertical lines as not vertical and in some cases will cause one's photographs to be of no value whatever. Consequently, I say "use a level." I have in mind a case which was an excellent example to prove my point that I shall mention later.

Camera Back Vertical.

Every photographer is familiar with the leaning-effect that is produced by pointing the camera either up or down; and he knows that this same effect can be produced by too free a use of the swing-back; so that to show a view or an object as it really is one must have the plate exactly vertical. Then if, for example, a chimney is leaning slightly, it will appear and should be shown as leaning in the photograph.

Camera about on the Level of Your Eye.

In nearly all things that we see a change of effect can be noticed if one raises or lowers the viewpoint; and, in some cases it is very important to be able to swear that the photograph is what a person would see at a certain place. For this reason it is important to have the lens of the camera on a level with one's eye when the exposure is made to give the true perspective.

Time at which the Picture was Made.

The exact hour and minute when an exposure was made is not absolutely necessary, as I have found that to say that a negative was made between the time of 1 and 1.15 p.m. is definite enough. In most cases as small an allowance as possible should be made to cover slight variations of time in watches or clocks.

Colour-Sensitive Plate Necessary.

It is well understood that the plate commonly called an "ordinary" one, sees only the blacks and whites in a subject at their true value, and it registers all other colours in tones that are, many times, exactly opposite to that which they should be. For example, red is shown as nearly black, and blue is white. This fact will give an entirely different idea of a scene than the one wanted; but this difficulty can be overcome by the use of panchromatic or orthochromatic plates and ray-filters. The use of these plates is familiar to most photographers, but for the benefit of those who have not used them detailed information regarding them may be obtained from the plate-manufacturers.

Making and Finishing Done by One Person.

This is important in that it saves calling more than one person as witness to the photographs at time of trial.

Exact Location of Camera.

In locating the camera definitely as to where it stood at the time of making the exposure, be sure to make all measurements from fixed objects and also to note carefully the direction in which the camera was facing. For example, a good description of location would read something like this: "Camera stood 6 ft. west of the west edge of the concrete-walk on the west side of Main Street and 52ft. 7 ins. south of the south edge of the concrete-walk on the south side of State Street. Camera was pointed a little east of north-east, facing across the intersection of State and Main Streets in the town of —— County of —— and State of ——. In all of my measurements I am allowing a possible error of 1 or 2 ins." This is clear, and I think that from this description of location a stranger could locate exactly where the camera stood.

No Retouching on Negative or Prints.

It is easily understood why no retouching can be done, as the prints must be true photographic reproductions of what they are intended to show.

The prints must be sworn to in the witness-box by the photographer who made them. In some cases his disposition can be used, although it is much better to have him there in person.

Photographs can be used in nearly all cases that come up for trial, viz.: accident, damage, attempt to defraud, larceny, and murder. For example—a case of accident. At about ten o'clock p.m., on a road from a famous "wet" town, a motor-cyclist collided with an automobile; result, the driver of motor-cycle was killed. The automobile driver called me out at once; and before anything was moved we made flashlights to prove that the automobile was on the right-hand side of the road—where it belonged—therefore the motor-cyclist must have been on the left side to run directly into the front of the automobile. At the trial further evidence brought out the fact that the motor-cyclist was partly intoxicated; and, with his photographs to back up his statements, the automobile driver freed himself of a large damage claim.

Damage suits are common, and usually well adapted to the

court use of photographs. I had prints in a case where payment was withheld for a silo, the claim being that the silo was crooked, cracked, and a source of danger to an adjoining barn. Prints from negatives made with the lens facing directly north, west, south, and east, with camera level and swing-back straight, showed that the silo was straight but the barn crooked! A telephoto-lens proved that cracks near the top of the silo did no particular harm, and these facts brought in a judgment of the full amount due to the contractor, with no deduction for any damages.

Insurance companies in particular are subject to attempts to defraud by arson. I had a case where a house insured to the limit burned under very suspicious circumstances. I made photographs that showed four distinct fires with no connection between them. Old, broken furniture was placed in the house—the good furniture was in a shed at the rear; and in one room I photographed two glass gallon jugs with a few ounces of kerosene in each. These prints were so convincing to the jury that the person who had the fire is now serving time at the State penitentiary.

I had an interesting case of larceny where two windows of a house were broken in an attempt to release the window catches. A man was arrested as he was leaving the house, after the people had heard the windows broken, but had seen no one near them. The windows were broken by the use of a brick, and photographs showed brickdust and particles around the break in the glass—they also showed the dust particles around one of the suspect's pockets. The man is now doing time for attempted burglary.

Murder cases offer unlimited opportunities for the use of photographs, as in these cases all points relative to the case are sifted to the finest possible degree, and the photographer has a good chance to show what he can do. I had a case where, at a farmhouse near a town, a young man was shot and killed, and an accident claimed. The interested persons asserted that the young man drove up in a machine with several others and stopped to talk with his friends at the farm—they were all Italians. While his friends talked he got out of the machine and went into the house. As he was coming back from the house one of the men who stood beside the machine fired a revolver which he was holding behind him and accidentally shot and killed the young man who was coming from the house. Their main witness claimed to be standing at the corner of the house where he saw it all happen. A photograph from the place where he claimed to be standing proved that he could see *nothing* on account of a row of lilac bushes between him and the road! A photograph from across a small field supported one of the claims of a witness for the State that he was not too far away to see—as he asserted that he did—that it was not an accidental shooting. The person who did the shooting is now doing time for manslaughter.

I could give case after case where photographs have showed themselves to be of practical value to prove claims and to bring actual scenes to the jury. In all cases photographs are worth many times their cost. Photographs as evidence are worthy of careful study on the part of the lawyer and the photographer. By careful study and consideration each can add to his reputation as an expert in his chosen line; and in addition each can add a few dollars to his bank account.

La Verne T. Ryder.

PRACTICUS IN THE STUDIO.

[Previous articles of this series, in which the aim of the writer is to communicate items of a long experience in studio portraiture, have appeared weekly since the beginning of the present year. It is not thought possible to continue the series to the length of that by the same writer which ran through the "British Journal" some years ago, but if any reader among the younger generation of photographers, and particularly those engaged as assistants, has a particular subject which might be dealt with, his or her suggestion will be welcomed. The subjects of the previous articles of the series have been as follows:—

A Talk About Lighting (Jan. 3).
The Camera and the Lens (Jan. 10).
Managing the Sitter (Jan. 17).
Backgrounds (Jan. 24).
Studio Exposures (Jan. 31).
Artificial Lighting (Feb. 7).
Printing Processes for Portraiture (Feb. 14).
Studio Accessories and Furniture (Feb. 21).
The Surroundings of the Studio (Feb. 28).
Studio Heating and Ventilation (March 7).
The Postcard Studio (March 14).
The Printing-Room (March 21).
About the Reception Room (March 28).
Home Portraiture (April 4).
Portable Studios (April 11).
Copying (April 18).
Handling the Studio Camera (April 25).
More About Lenses (May 2).
Enlargements (May 9).
Advertising the Studio (May).

MOUNTS AND MOUNTING.

The style of mounting at present in fashion is so simple that it might at first seem as if nothing could be said on the subject. All that is apparently necessary is to get a piece of stout brown paper and dry-mount the print upon it. This, however, is not quite the case, as to get the best effect out of any print it must have a suitable setting, and to provide this is not so easy a matter as it might appear. There has been, I know, considerable difficulty in procuring suitable papers and cards during the war, but as these are produced in both England and America, it is to be hoped that we shall soon have a full range of tints and surfaces to choose from.

It does not seem to be generally appreciated that the appearance and tone-value of a print are greatly affected by the mount upon which it is placed, or else we should not see so many sepia-toned prints upon brown mounts, which nearly match their general tint, and hardly show where the print ends and the mount begins, thus causing a general flatness of effect which is far from pleasing. It is, fortunately, impossible to reduce mounting to a system and to give rules for the choice of colours, but there are one or two points upon which most successful workers are agreed. One is that the depth (not colour) of the mount should never be as dark as the deepest tone in the print nor lighter than the highest light. Between these two limits there is a wide range to choose from, and even in everyday portraiture the general appearance of the work may be greatly improved by keeping this in mind. If we have only two mounting papers in stock, a cream and a rather dark brown, it is easy to see how much better some prints will look upon one than upon the other, and if we indulge in a combination of the two, one being used as a tint showing a narrow margin, we have an additional means of improving the effect. Some mounting papers have a different colour or depth on each side, so that it is possible to get tint and mount out of the same sheet. A good effect, and

one I am rather partial to, is to print with a narrow margin, so that the print is kept from running into the mount, and can be placed upon almost any suitable colour. The margin being exactly the same colour as the highest light of the print, cannot clash with it, nor with the mount itself. A trained eye will guide you to do the same thing with other colours, and the photographer who takes a pride in his work cannot do better than to procure a number of tints and mounts in various shades of brown, buff, cream, grey (not blue grey), and spend a spare hour or two in trying combinations of them with various classes of print. I hope that all the stocks of mounts with embossed coloured borders are used up, and that they will not be revived after the war. If we are to have any fancy work, let it be confined to folders, as these can be thrown away if the customer does not like them. For cheap work ornate mounts will probably always be popular, but for anything which is intended to be artistic they are as much out of place as a heavy signature embossed in gold has been found to be. Plate-marked mounts had a long run, but they, too, have died the death; photographs are not printed from copper-plates, and a good photograph does not need any such false pretences to help it out.

Trimming plays an important part in the artistic mounting of a picture, and for this reason I am glad that most photographers have abandoned the use of "stock" mounts. No matter how careful one may be in posing or in placing the figure on the plate, there are occasions when the necessity for cutting a picture to fixed dimensions will be detrimental. When long panel pictures were in vogue it was frequently necessary to cut off a portion of the clothes so as not to exceed the prescribed limits, but now so long as the picture is approximately the size paid for nobody will complain. It may be pointed out that in many cases judicious trimming will help the composition, bad balance being improved by cutting away unoccupied space at the side of the figure and making the edge serve as a support.

It is obvious that for trimming of this class the old style of cutting shape is inadequate, and those who prefer to use the knife will find that one glass of large size with cross lines ruled on the under side will be more convenient and will answer for all sizes, as two edges can first be cut and the print turned and squared up by placing the two edges against the nearest two lines and cutting the remaining sides. Obviously it is not necessary that the cut sides should touch the lines so long as they are parallel with them.

The most convenient way of cutting prints is to use a Merrett trimmer. With this it is easy to get perfectly square corners and to repeat any given size by laying the print accurately by the rule at the side. The only precautions necessary are to see that the print touches the rule throughout its whole length and to press firmly on the print while cutting. If the print slips, the corners will be out of truth. If at any time the trimmer be suspected of being out of adjustment, it may be tested by folding a piece of foolscap paper so as to give a sharp edge at the fold. Place this accurately to the rule and make a cut. When the paper is opened the edge should be quite straight across the sheet. If it be higher or lower in the middle the rule requires adjustment. This type of trimmer should not be used for heavy mounting papers or cardboard. For these a lever cutter should be used, and one fitted with a reliable clamp should be chosen. These cutters may also be used for prints, but require more care to get true rectangles. Some of the smaller sizes are unprovided with clamps, and when using these it is a good plan to press the print down with a glass cutting shape. This prevents the print from buckling and springing away from the blade.

Ovals and circles are best cut with the aid of zinc or brass shapes and a swivelled wheel cutter, a zinc plate being used to support the print. Many people find difficulty in using this simple appliance, due usually to a lack of confidence. The cutter must be kept perfectly upright and pressed firmly against the edge of the guide. Practice upon a few waste prints will soon give the necessary touch. The zinc plate should be kept quite smooth, or the prints will have ragged edges. An occasional rub with emery paper will do all that is necessary. For odd sizes in circles I have found the Waterhouse diaphragms of a large lens very useful. The edges of the shapes must be kept free from notches, or the cutter will have a tendency to run into the print; but this is easily avoided by rubbing the notches with the emery paper.

A mount-cutter's knife is a most useful tool, both for trimming prints and cutting card; with a little practice it can be used for bevelling sketch portraits, making cut-out mounts, masks, and many other purposes. It is best to cut upon a glass plate for paper, as a cleaner edge is thus obtained. The edge of a good knife will not turn upon glass, nor will the glass be scratched. Nearly all mounting, at least in the smaller sizes, is done by the dry method, which gives a good finish, obviating the necessity for rolling, and avoiding cockling even upon the thinnest mounting papers. The following points must be observed to ensure success:—Both print and mount must be quite dry, or the print will stick to the plate, or at least show shiny patches where the damp places are. The heat must be adjusted to suit the tissue in use, and tissue requiring a high temperature should be avoided. During the war some very poor stuff was on the market and almost drove some people back to wet mounting. When cutting prints they must always be kept face upwards. When there is a narrow strip to be taken off, it is easier to see the width of this if the print is cut face downwards; but if this be done a line of shellac will show round the edge of the print. If any of this gets upon the plate the next print will probably stick to it. Prints may be tacked on to mounts very neatly by using a narrow strip of tissue at the top edge of the print. This should be cut a little shorter than the edge, so that the print will not have to be trimmed after attaching it.

Wet mounting is so well known that no detailed instructions are necessary except upon points where the beginner is likely to go wrong. The ready-made dextrine mountants of the Tixit type are the most convenient to use, and have the advantage that prints may be unmounted at any time by damping between wet blotting paper, but properly made starch is as good, and just now much cheaper. Few people make good starch paste, but it is easy if done as follows:—Mix the powder into a thick cream with cold water and see that any lumps are broken up; pour on absolutely boiling water, stirring all the time, until the paste goes clear and thickens; stir for a few moments longer and set aside to cool. Do not use until quite cold. Remove the top skin and take some of the paste into a small basin or saucer, so that it may be well broken up with the brush before spreading. Prints to be wet-mounted should be soaked in water till limp, then taken out singly and laid in a pile on a sheet of glass. This should be stood on edge and allowed to drain well, after which any surplus should be pressed out with a dry towel. Paste the top print, lift one corner with the point of a knife, and pick up the print with the thumb and finger of the left hand, taking care not to take hold near the edge; take the other corner with the right thumb and finger and place the print in the correct position on the mount. If not quite straight, put the tips of the fingers firmly on the face of the print and slide it into position. Rub down with a soft, damp sponge or a sheet of dry, clean paper. Hang up until the surface is fairly dry, but do not let the cards curl; pile the prints up together and put under a weight until quite dry. If a mounted print dries flat it will not curl afterwards; but if allowed to curl in drying,

nothing will flatten it permanently again. While on the subject of curling I may point out that only platinum prints and those upon plain salted paper—that is, without a gelatine or collodion coating—should be "tacked on" to a mount by the top corners only, as emulsion papers, although quite flat at first, are liable to curl with every change in the atmosphere.

Passe-partout mounting is a convenient way of preserving prints which it is not desired to frame. It consists of binding up a mounted print with a sheet of glass in front, with or without the addition of a cardboard back, to which rings for hanging or a strut back can be attached. Ready-prepared binding paper, which only requires damping, may be purchased in rolls, and furnishes the most convenient way of working; but any stout paper or bookbinder's cloth may be used. The proper way to bind is to cut the four strips to fit the front glass, and to attach them very carefully upon the face, then turn the glass face down, lay the mounted print and back (if any) upon it, re-damp the adhesive on strips, turn them down on to the back, and rub well together. You will thus ensure a perfectly square and true edge on the front of the glass; the back does not matter.

Prints have sometimes to be mounted in optical contact with glass. This can easily be done by making a solution of clear gelatine, one ounce in a pint of water. This is poured while warm into a dish which will easily take the glass. The glass is then immersed, and when it has reached the temperature of the gelatine, is followed by the print face downwards; the two are withdrawn together and contact obtained by means of a flat squeegee. When quite dry, the face of the glass can be cleaned from any smears of gelatine. During the whole operation the gelatine solution must be kept warm and quite fluid. If there is any tendency to set while in use, it is useless.

I have sometimes had to mount prints upon wooden panels, and for this I apply fish-glue to the back of the dry print, using rather a stiff brush. The only points to observe are that the margins are well coated with glue and that any bubbles are carefully rubbed out Bromide prints so treated may be varnished without further preparation. Engravings or platinotypes require careful sizing with a gelatine solution to prevent the varnish from penetrating the surface.

PRACTICUS.

SOME TESTS OF THE ACTION OF A SHUTTER OF THE FOCAL-PLANE TYPE.

[In a recent issue of the "Bulletin of the French Photographic Society" MM. M. Equer and E. Cousin, the latter the secretary of the Society, described some interesting experiments made by them in determining the difference of exposure given by a slit travelling close in front of the plate according to the stage in its journey across the sensitive surface. The experiments were made, not with a flexible blind wound from and to a roller, but with a rigid shutter with a fixed slit in it. It will be seen that the authors discover considerable variations in the exposure, and while they do not particularly describe the mechanism of their sliding plate, they express the opinion that the difference would be greater still in the case of a flexible blind, which is unrolled from one spindle and rolled upon another.—EDS. "B. J."]

THE ingenious method of measuring the speed of instantaneous shutters by means of "singing flames," which was worked out some few years ago by M. Benoist, has been considerably used as a very simple and exact means of measuring the actual speeds of shutters. The results obtained have shown the usefulness of the method for lens shutters.

The same method may be employed equally well for the measurement of the speed of focal-plane shutters. Experiments in this application have been made in the laboratory of the French Photographic Society, and have prompted the observations which are the subject of the present communication.

In the camera which was tested the slit is contained in a sliding plate which is moved by a spring. By altering the tension of the spring the speed of movement of the sliding plate can be varied. The camera has a winding key and twelve notches corresponding with tensions from the lowest to the highest of the spring. The width of the slit may be altered, but has been kept at a single constant width for all the tests described below. It is plain that the times of exposure are proportional to the widths of the slit. There was no purpose, therefore, in making measurements for other widths of slit. The exposures are a matter of calculation so long as the slit is not so greatly narrowed as to give rise to diffraction phenomena. The only variable element in the tests is the tension of the spring.

The camera can be placed for use with the slit either horizontal or vertical. In the former case the slit-plate slides from top to bottom along a vertical path. In other words, it falls; and as it has an appreciable mass, the action of gravity is added to the action of the slit and the speed is increased. In the other position, at right-angles to the first, the plate slides from right to left along a horizontal path, the slit being vertical. Here gravity does not affect its action, or, at any rate, has no further effect than increasing the friction and thus corresponding with a retarding action, if any.

The speeds are, therefore, different for a given tension of spring in the two positions, and hence the necessity of making two series of tests, one with the slit horizontal and the other with the slit vertical.

The fact that the slit-plate has a definite mass involves another result. At the moment of release the slit-plate starts from rest: its mass opposes the property of inertia to its movement—that is to say, its action is the one familiar in mechanics as starting resistance. Let it be supposed that the slit-plate has begun to move: its speed goes on increasing and would increase proportionally to the time if the motive force remained constant up to the moment when the slit-plate, having traversed its course, is arrested by the stops. But, in fact, the conditions of variation of the speed are complex. On the one hand the spring relaxes during the operation, and thus the motive power is not constant. On the other hand the constructor is at pains to provide opposite spring mechanisms for the purpose of regulating this acceleration; but when every precaution has been taken the compensation is incomplete. Thus, in the camera tested—and it is one of the highest reputation for the perfection of its construction—the different parts of the plate are unequally exposed: the time of exposure for the side of the plate corresponding with the departure of the slit-plate is appreciably greater than that of the part of the plate over which the slit-plate first passes. In ordinary practice this difference is not of great importance, but it is exhibited in a marked manner when the illumination of the subject photographed is uniform and when the exposure is on the underside. The image then shows, as a whole, an appearance of gradation in the direction corresponding to the movement of the slit.

When the position of the apparatus is such that the slit-plate slides from above to below the least exposed side of the plate is the lower edge. In the case of a landscape, this part is the sky, and thus a relatively shorter exposure is quite in place: the defect is converted into an advantage. However that may be, it is seen that if it is wished to ascertain exactly the speed of a focal-plane shutter it will not do to measure this speed anywhere on the plate. The results will be very different according to the position which the image of the singing flame occupies on the plate. Thus the plan is adopted of measuring the speed at the beginning, middle, and ends of the movement of the slit-plate. If three singing flames are used, this result is obtained by arranging them so that their images are projected one on the edge of the plate first uncovered by the slit, the next in the middle, and the third on the edge of the plate at which the slit passes off. Fortunately, it is possible to dispense with three separate flames and to use a single one, two other images of which are obtained by means of suitably placed mirrors. The tests were made under these conditions.

In the case of lens shutters, in order to separate the successive images of the singing flame, the camera was moved in any convenient plane. There was no need to concern oneself with the position of the axis around which rotation was made. Not so with a focal-plane shutter: in this case the line described on the plate by the successive images of the flame must be parallel with the edges of the slit. This is a necessary condition. If the line of the flames are oblique, the results are inaccurate: in place of the real speed one would measure a greater or lesser speed according to the direction of the inclination. There would be measured, in fact, a speed which would correspond to another width of slit or to another speed of the slit-plate.

The question arises—has this theoretical consideration any practical effect? A simple case may be taken: Suppose the slit was vertical and that rotation was done, as usual in tests of lens-shutters, around a vertical axis. Instead of being parallel, the line of the flames and the edges of the slit would be at right-angles, and the line of the flames would be impressed upon the sensitive plate in the direction of displacement of the slit. Thus the slit would follow the successive images of the flame. If the two moving elements proceeded abreast at the same speed the flames would be impressed throughout the whole width of the plate, and the result would be as though one had used an open lens without a shutter at all. If the two moving elements, moving always at the same speed instead of being abreast, are one behind the other, no image of the flames will be impressed on the plate, and the result will be as though the shutter had not been opened. In both cases it is plain that there is a great error. The error will be great if the speeds of the two moving elements, instead of being equal, are only of the same order of size. The question is—can it be so in practice. It is easy to show that it can, if we consider that the speeds in practice of the two moving elements are both of the order of size of about 1 metre per second. For a singing flame of frequency of 1/500th of a second the speed of movement of 1 metre per second on the plate for the successive images of the flame corresponds with a difference of 2 mm. between the axes of the images, since 0.002 m. × 500 = 1 metre. For a slit of 0.01 m. width the speed of 1 metre per second corresponds with an exposure of one-hundredth of a second, since 0.01 m. × 100 = 1 metre. Rotation should, therefore, be made around a vertical axis when the slit is horizontal, and around a horizontal axis when the slit is vertical.

Here it may be well to interpolate a note on the condition of parallelism between the path of the image of the flame and the edges of the slit and on the error involved when this condition is not observed. These can be set forth exactly as follows:—Let M N O P (Fig. 1) be the sensitive plate, A B and C D the two edges of the slit, and L the width A C of the slit. Let V,

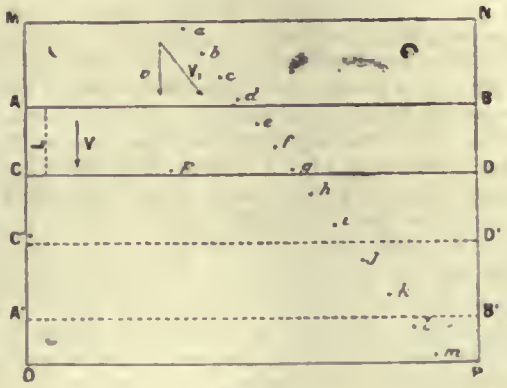


Fig. 1.

in size and direction, be the speed of the slit. The speed of the shutter is then the time of exposure of a point p of the plate. This time T is the time which elapses between the moment when the edge C D uncovers the point p and the moment when the edge A B covers it up again—that is to say, the time which the slit takes in order to displace itself through the distance L so that the edge A B comes into the position C' D and the edge C D into that of C' D'. We then have—

$$T = \frac{L}{V}$$

Now, on the other hand, let $a, b, c, d, e, f, g, h, i, j, k, l, m$, be the successive positions of the images of the singing flame, impressed or not impressed on the plate. Let V_1 in size and direction be the speed of movement, which is assumed to be uniform, of these images along their oblique path. Lastly, let v, in size and direction be the component of V_1 along a path parallel to V. If we assume now that the edge C D, just behind the moving image, overtakes it and uncovers it at g, the image g is the first which can impress itself on the plate. The images h and i are next impressed. At the instant when the slit will have been moved through the space L we shall have reached the end of the time T which is to be found. Now during this time the moving image will itself have moved so that the edge A B, arrived at C D, just does not cover it, hence the error. The other images j, k, are just about to impress themselves up to the instant when the edge A B, arrived at A' B', shall have rejoined and again covered the image of the flame. Thus, what we measure, when counting the number of the images is not the time T of exposure of a given point of the plate, but the time T_1 during which the images of the flame have impressed themselves.

Now the relative speed of the slit, relative, that is, to the moving image, is V-v, so that—

$$T_1 = \frac{L}{V - v}$$

The error $T_1 - T = E$ can, therefore, be expressed as—

$$E = \frac{L}{V - v} - \frac{L}{V} = L\,\frac{v}{V(V - v)}$$

In order that the error shall be zero, v should disappear. Thus the speed V_1 should not have a component parallel to V_1, which is the same thing as saying that the path of the moving image should be parallel to the edges of the slit.

On the other hand, it is clear that—

$$\text{When } v = V, \frac{T_1}{T} = \text{infinity}.$$

The error is then such that the test gives the same result as though there were no shutter.

$$\text{When } v = V/2, \text{ then } \frac{T1}{T} = 2.$$

The error is then such that the results are twice what they should be.

$$\text{When } v = \frac{V}{100}, \frac{T_1}{T} = \frac{100}{99},$$

and the error is then not more than 1 per cent. It will thus be seen that in practice approximate parallelism is quite sufficient.

Coming now to the test in which the slit was horizontal, the apparatus was fixed on a horizontal platform movable round a vertical axis. The height of the platform was adjusted so that the direct image of the singing flame came half-way up the plate. The two mirrors were placed, one above and the other below the flame at angles such that the two reflecting images of the flame were projected one on the upper edge and the other on the lower edge of the sensitive plate. In each test there was thus obtained at a single operation on the plate three lines of horizontal flame. The tests were made in succession for each of the twelve degrees of spring-tension corresponding with the setting of the notched winder. The results are shown in the following table:—

TABLE I.—HORIZONTAL SLIT.

Speed marked on the camera.	Speeds measured. At upper edge of plate.	At middle of plate.	At lower edge of plate.
1/40	1/49	1/63	1/95
1/60	1/61	1/69	1/115
1/80	1/61	1/87	1/130
1/100	1/72	1/104	1/130
1/130	1/74	1/104	1/130
1/160	1/87	1/130	1/140
1/180	1 87	1/162	1/173
1/200	1/100	1/162	1/173
1/220	1/104	1/162	1/226
1/230	1/104	1/167	1/236
1/240	1/121	1/167	1/236
1/250	1/127	1/173	1/248

In making the tests with the slit in a vertical position the camera was fixed on a platform movable around a horizontal axis. The platform was placed so that the direct image of the flame was formed halfway along the width of the plate. The two mirrors were placed one to the right and the other to the left of the flame in position such that the two reflected images of the flame were formed one on the right-hand edge and the other on the left-hand edge of the plate. The negative thus showed three lines of vertical flame. In this case a special precaution was necessary. The singing flame is thin and long, and may be likened to a small vertical rod. When the line of the flames is horizontal the images of the small rods, more or less deformed by movement, are so separated that it is easy to count them. But when the line of flames is a vertical one, as in the present instance, the images of the rods tend to overlap and can no longer be counted. The practical means of overcoming this difficulty consists in surrounding the tube of the singing flame with two superposed envelopes of opaque paper, between which a space is contrived forming a circular slit of from 1 to 2 mm. diameter. The envelopes can be adjusted on the tube, so that the slit comes on a level with the flame and the length of the flame can thus be reduced to any required dimension necessary for avoiding overlapping of the images. The results obtained were as follows:—

TABLE II.—VERTICAL SLIT,

Speeds marked on camera.	Speeds measured At right-hand edge of plate.	At mid position of plate.	At left-hand edge of plate.
1/60	1/37	1/23	1/52
1/80	1/49	1/41	1/65
1/100	1/58	1/58	1/89
1/130	1/58	1/80	1/114
1/160	1/74	1/104	1/130
1/180	1/74	1/104	1/130
1/200	1/74	1/116	1/149
1/220	1/90	1/130	1/149
1/230	1/90	1/130	1/174
1/240	1/95	1/137	1/174
1/250	1/104	1/173	1/236

The diagram Fig. 2 is a reproduction of one of the test negatives, namely, that corresponding with the position of the vertical slit for the speed marked on the camera as 1/220th. It will be seen that the three lines of the flames corresponding respectively with the right-hand, mid-way, and left-hand por-

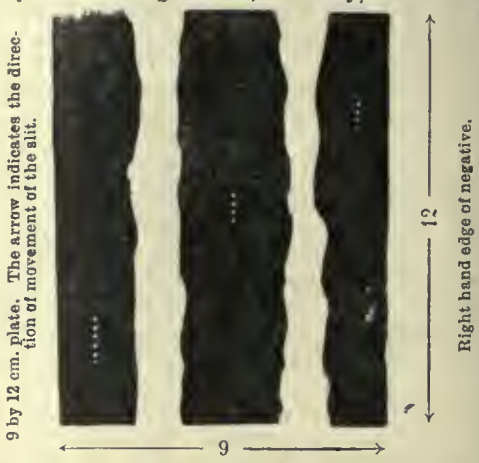


Fig. 2.

tions record, in the first case, six flame images, one partly exposed, the second four fully exposed, and the third four, of which one is partly exposed. (In reproducing the diagram from our French contemporary it may unfortunately happen that this minute difference will not be clearly shown in the printed reproduction.—Eds. "B.J.") The right-hand edge thus receives an exposure of 1/90th secs., the mid-way portion one of 1/130th secs., and the left-hand edge an exposure of 1/149th secs., the singing flame having a frequency of 520 vibrations per second.

Summarising the results of the tests, gravity exerts a different action according as the camera is held vertically or horizontally. The horizontal slit falls vertically, but the vertical slit slides laterally. For this reason a series of tests is necessary for each of the two positions.

Moreover, in consequence of the starting resistance and the acceleration of movement of the slit, the different parts of the plate are unequally exposed. It is, therefore, necessary to measure the time of exposure at the edge of the plate which the slit first reaches, at the middle of the plate, and at the edge which the slit last uncovers on leaving the plate. The three measurements can be made at a single operation by means of one flame, two supplementary images of which are formed by mirrors.

The direction of the axis around which the camera is turned in order to separate the images of the flame is of importance: this axis should be vertical when the slit is horizontal, and *vice versâ*.

Also, when the axis is horizontal, overlapping of the images of the flame is prevented by reducing their length by surrounding the flame with an annular diaphragm.

The measurements show that in the camera tested:—

1. The speeds are very different, other things being equal, according as the apparatus is held one way or the other, especially when the spring tension is small. The effect of gravity is also proportionately greater as the spring tension is diminished.

2. The variation in the exposures obtained at opposite edges of the plate varies considerably—as much as in the ratio 1 : 2.

The tests refer to a shutter the slit of which is contained in a sliding plate. It would be of interest to make similar measurements on the speeds given by focal-plane shutters of the roller-blind type. The irregularities due to weight would be of a similar kind, but no doubt still more marked.

M. EQUER.
E. COUSIN.

A TABLE FOR P.O.P. TONING.

Messrs. Rajar, Ltd., have recently published the following table for the toning of P.O.P. on the system, first suggested, we think, by the Kodak Company, according to which a quantity of toning bath is measured out just sufficient for a certain number of prints, the bath being thrown away after use. Such a system is certainly one which goes a very long way to ensuring regularity of tone throughout a number of prints.

No. of Prints.			Water.	Ammonium Sulphocyanide 150 grs. in 15 oz. Water.	Gold Chloride 15 grains in 15 ozs. Water.
¼ pl.	½ pl.	1/1 pl.			
4	2	1	1 oz.	1 drm.	1 drm.
8	4	2	2 ,,	2 ,,	2 ,,
12	6	3	3 ,,	3 ,,	3 ,,
16	8	4	4 ,,	4 ,,	4 ,,
20	10	5	5 ,,	5 ,,	5 ,,
24	12	6	6 ,,	6 ,,	6 ,,
28	14	7	7 ,,	7 ,,	7 ,,
32	16	8	8 ,,	8 ,,	8 ,,
36	18	9	9 ,,	9 ,,	9 ,,
40	20	10	10 ,,	10 ,,	10 ,,
44	22	11	11 ,,	11 ,,	11 ,,
48	24	12	12 ,,	12 ,,	12 ,,
64	32	16	16 ,,	16 ,,	16 ,,

The simple rule to observe in compounding a toning bath:—Equal parts of each solution are taken, and for as many drachms of *one* of them, the same number of ounces of water must be added.

BRITISH PHOTOGRAPHIC MATERIALS AND FOREIGN MARKETS.

Not being on the spot it is impossible to know what efforts the British manufacturers are making in regard to competing in the foreign markets, but naturally one feels convinced that business men are doing all that is necessary in preparation for the commercial war, for, with the knowledge that Germany, despite internal dissensions, is actively engaged and determined to flood the Continental markets with her products, it is most important to export as soon as the permission is given.

That there is, on the Continent, a rich harvest awaiting the makers of photographic material goes without saying, and Switzerland is one of the countries where British goods are highly appreciated. Unfortunately, during the past four years the British manufacturers have been off the Swiss markets, and this means that a considerable effort must be made. The German manufacturers have had the field practically to themselves. Ernst Lomberg, of Langenberg, has inundated the country with his plates, and has and will have a firm hold until the plates from England appear on the scene when, it is quite possible, the superior quality will tell. In this respect it may be well to mention that the plates which have had an enormous sale are those of ordinary speed, and especially made for rotary photogravure negatives and positives. There is a big field for this class of work; the sizes of plates usually employed are 13 x 18 cm., 18 x 24, 24 x 30, though 30 x 40 and even larger are in demand. Another size, 21 x 27 although not frequently used, is on the market.

Panchromatic plates for three-colour work are slowly becoming popular and may in time rival, or even oust, the emulsion which has had a long run of success. Lomberg, taking advantage of the opportunity that war had placed in his way, put forward a panchromatic plate for process work, but, from personal observation, it has not attained the high standard of perfection of the plates of English manufacture. But it is not only process and photogravure work that call for plates. Plates and films for outdoor photography have ready and appreciative customers. Bromide and other papers will meet with a steady sale. Certain British chemicals, although up against strong competition, stand every chance of competing favourably with foreign products, again, owing to their reputation and quality.

Two things which might materially assist the sale of British products would be a depot in one of the large towns where every article would be available, and, which is perhaps more important, a liberal distribution of attractive advertisements, such as are seen in the Almanac. These, exposed in the shops of photographic dealers, would not fail to attract attention.

Plates and papers should have full directions, formulæ and observations printed in English, French and German. This is done in many instances, but it is absolutely necessary, and its importance cannot be overestimated.

The graphic arts should find unlimited scope on the Continent. British picture-postcards are greatly appreciated, especially those of a humorous nature. Christmas and New Year cards as usual were "Printed in Germany." But goods that are made in England, or "Printed in England," are highly popular, and it behoves the British makers to remember this and to take every advantage. Besides, after having beaten the Hun in the field, it would be a glorious thing to drive him out of the markets of the world.

E. J. Glumart.

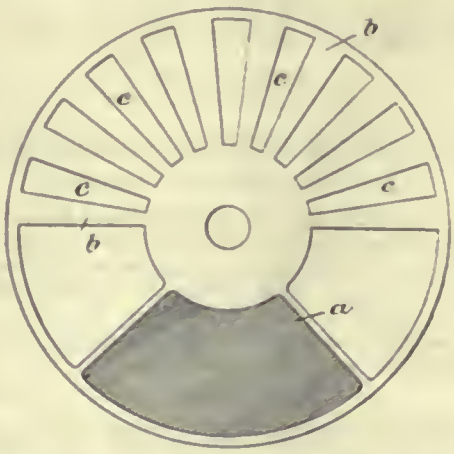
Patent News.

COMPLETE SPECIFICATIONS ACCEPTED.

These specifications are obtainable, price 6d. each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

Cinematograph Shutters.—No. 114,994 (November 27, 1917). The masking blade *a* of the shutter is made in the form of a skeleton frame covered with a sheet of dark blue or other coloured gelatine, mica, or the like, such sheet of gelatine having plane surfaces and being cemented to the skeleton frame. In



conjunction with the masking blade *a* is shown a flicker blade *b* of opaque material. This flicker blade is formed with radial openings or slots *c*. Any number of such slots may be used, nine being shown in the drawing as having been found very suitable. Alfred George Smith, 5, Winter Garden Terrace, Southport.

Trade Names and Marks.

APPLICATIONS FOR REGISTRATION.

Meritol.—No. 389,170. Photographic chemicals. Johnson and Sons, Manufacturing Chemists, Limited, 23, Cross Street, Finsbury, London, E.C., fine chemical manufacturers. March 12, 1919.

CATALOGUES AND TRADE NOTICES.

Messrs. Wahltuch, Smith, and Co., Ltd., 30, Chapel Street, Salford, Manchester, have just issued a leaflet describing a number of their specialities in equipment of professional photography. These include a universal printing cabinet, to which their "Pelican" strip printer can be adapted, the "Bram" vignette printing frame, sketch printer, and copying outfit. The list is one which represents much inventive capacity applied to labour-saving, and any professional photographer who has not received one may be advised to get one.

Messrs. Wallace Heaton, Ltd., 17-19, Change Alley, Sheffield, send us their May catalogue of second-hand apparatus. It is a 48-page closely-printed list, describing a very great stock of cameras, lenses, and other apparatus. A feature of the list is its illustrations of the more popular models of hand and reflex cameras, but its many itemized bargains will attract the photographer who is on the look-out for equipment for the coming season. Messrs. Wallace Heaton offer to post the monthly issue of this list regularly to any photographer who will so apply.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Saturday, May 24.

Hackney Photographic Society.—Outing to Pinner.
Liverpool Amateur Photographic Association.—Outing to Parkgate.
South London Photographic Society.—Excursion to the Zoo.

Monday, May 26.

City of London and Cripplegate Photographic Society.—Ladies' Evening. Dr. G. H. Rodman, M.D.

Tuesday, May 27.

Royal Photographic Society.—Technical Meeting. "Spiders: Their Structure and Habits." Dr. G. H. Rodman.
Hackney Photographic Society,—Annual Meeting.
Manchester Amateur Photographic Society. — "A Ramble Into Birdland." Rev. E. C. Harris.
Chelsea Photographic Society.—"Pictorial Ideals." M. O. Dell.

Wednesday, May 28.

Croydon Camera Club.—Members' Print Display.
Photomicrographic Society.—Annual General Meeting, Exhibition, etc.

Thursday, May 29.

Hampshire House Photographic Society.—"Developers and Development. G. C. Weston.

ROYAL PHOTOGRAPHIC SOCIETY.

Meeting held Tuesday, May 20, Dr. Rodman in the chair.

Mr. E. W. Mellor delivered a lecture entitled "The Home of the Rajput," showing by a large series of altogether admirable lantern transparencies the country and customs of the well-known Indian race.

On the proposition of the Chairman the heartiest thanks of the large audience were accorded to the lecturer.

PROFESSIONAL PHOTOGRAPHERS ASSOCIATION.

A meeting of the Council was held on Friday, May 9th, 1919.

Present: Messrs. Gordon Chase, Corbett, Ellis, Fry, Gray, Haines, Lang-Sims, St. George, Speaight and Wakefield (London members); and Marcus Adams (Reading), T. Chidley (Chester), Illingworth (Northampton), Lankester (Tunbridge Wells) and Read (Southport).

The minutes of the previous meeting were read and confirmed. Letters were read expressing regret at inability to attend from Messrs. Spink (Brighton) and George Hana (London).

The Hon. Secretary reported:—

That he was in correspondence with the Hon. Secretary of the Institute of Ophthalmic Opticians in the matter of the consideration of possible future trade regulations which might affect their mutual interests. He also reported that twelve new members had been enrolled since the last report, and that about thirty letters from members dealing with controversial and other matters had been dealt with by himself since the last meeting. Two of these were left over for the Council's consideration, viz., one from a member who requested advice in regard to the allowance of holidays with payment to assistants; and another suggesting that London photographers should be provided with a members meeting from time to time.

In regard to the holiday question, Mr. Speaight stated that his firm gave ordinary assistants one week's holiday each year with pay, heads of departments two weeks' holiday with pay. Mr. Haines mentioned that his firm gave one day (with pay) for each month of service to every assistant who had not served a complete year. After twelve months' service each received two weeks holiday. Further opinion was substantially to the same intent and the Hon. Secretary was directed to confirm his reply to the inquiring member.

In regard to the London members' meeting it was pointed out that the meetings had been tried and had been abandoned for several reasons, each a small matter in itself, but cumulative in effect. Country members thought that London members had some advantage over them in the matter, and the Council felt that the energies of the officers were more usefully employed in attending to the purely business requirements of their large membership. There was a feeling on the part of some members of the Council, however, that the meetings should be tried again, and the Hon. Secretary was instructed to write the inquiring member accordingly.

A case of infringement of copyright was reported by the Hon. Secretary, and the Council endorsed the action already taken. The Hon. Treasurer placed the banker's pass book on the table; the Council authorised the payment of accounts amounting to £26.

Mr. Illingworth moved that the P.P.A. apply for a charter of incorporation, and offered arguments in support of his proposal. The first was that they would raise and establish their status. They would cease to be one of a thousand trade and business associations of which little or no notice is taken because there was nothing on the face of them to show that they were representative or of any standing. The fact that they were incorporated would carry with it a recognition of their standing as a body representing the practisers of the art of photography. As showing that incorporation is deemed of importance it was mentioned that all Chambers of Commerce of any notability were becoming incorporated, because Chambers of Commerce which were incorporated are brought into closer and more helpful relations with the Board of Trade. Then in all matters affecting their business and art on which it might become necessary or desirable to make their views known, they would, as an incorporated body, be more likely to get a hearing and be recognised as the official organ of the great business they carried on. As an incorporated association they would have the privileges of a limited company—could act as a legal body and do many things for the promotion of photography and the protection of one another, much more easily than a loose association. That this was recognised was seen by the powers under the Companies' Acts for the registration as incorporated bodies of associations for the promotion of art, science and commerce without the use of the word "limited," but with the advantages of a limited liability company, the incorporated associations being limited by guarantee—that is, every member guarantees to pay his share of the debts and liabilities of the Association if it should be wound up during the time he was a member or within twelve months afterwards. This gave membership a more important and more stable character.

Mr. Illingworth continued that he was not a lawyer and could not explain the legal advantages which an incorporated association would have, but he understood there were many things, such as acquiring central offices, forming a club, carrying on experimental work. In fact, all the things which one could think of as being within the scope of a really vigorous association in the interests of their art and business could be done much more easily and effectively by an incorporated body than by an association which was a mere society, the powers, rights, liabilities and responsibilities of the members of the committee of which were often the subject of doubt and difficulty. That was why so many trades and pro-

[illegible] were taking advantage of incorporation. He urged that they should make a bold move to give dignity and importance and [illegible] to their association. At any rate, he felt there was quite enough of reason in his suggestion to make it worthy of consideration, and he should be quite satisfied if a special committee were appointed to explore the subject and report to the members. He could not but think that such a committee would report in favour of incorporation, but in any case the proposal would be carefully considered and canvassed from every point of view.

Mr. Haines seconded the resolution pro-forma, and to obtain a discussion. Mr. Illingworth in reply to a question thought the [illegible] would be about £100. The President (Mr. St. George) thought the expense a secondary matter provided that some concrete advantage were obtained. After a discussion, and in order that the members might have a better opportunity of following Mr. Illingworth's statement, it was resolved that typewritten copies of Mr. Illingworth's introductory remarks be circulated amongst members of the Council so that they can peruse them before the next meeting, and that the matter be placed on the Agenda for the next meeting.

Mr. Marcus Adams stated that he desired to ascertain the views of the Council upon the reports which he had submitted on assistants, and to ascertain if it was intended to proceed further.

Mr. Read said that his idea was that parents should know that boys who adopted the photographic profession as a business career had prospects of good appointments, and for their encouragement examinations should be held, and awards given for good work.

After discussion a committee consisting of Messrs. Adams, Haines, Lang-Sims, Speaight and Wakefield was appointed to go into the matter and, if possible, formulate and present a scheme to the Council, Mr. Marcus Adams to act as convener.

Mr. Marcus Adams further suggested the appointment of a committee to consider the most suitable arrangements for a future secretariat. After discussion, provision was made for the engagement of such clerical assistance as would prove necessary to carry on the work of the Association.

The Hon. Secretary passed round copies of an official explanation of the Whitley Report, and was instructed to send copies to all members of the Council not present.

The Hon. Secretary reported that a new edition of the Handbook, revised, and with added information, was in course of preparation, and when completed would be issued to all members.

Mr. Wakefield reported the result of his interview with the secretary of a London trade association at whose premises, centrally situate, the P.P.A. could have a London office. Such an office was available. It was resolved that a committee to consist of the President and Messrs. Haines and Wakefield should interview the Secretary of the trade association and report to the Council.

CROYDON CAMERA CLUB.

Last week a display was held of prints from negatives taken at the Easter outing. The exhibits were few and the award was withheld. A masterpiece by Mr. J. Keane revealed a member supported by a signpost outside the halfway house. The upright furnished by the post, in combination with the inclined line of the figure, according to Mr. Brigham Young, is the ideal composition for giving a sense of stability to the picture. Another fettering convention blown to pieces.

Mr. Cavendish Morton criticised the exhibits in a very hopeful way, but put his foot in it badly by inadvertently falling foul of Mr. Harpur's pet method of introducing art by tulle on the lens. Being admonished by the indignant pictorialist, the critic mildly pointed out that if inferior artists, such as Whistler, could achieve good results they did without employing tulle, it was open to Mr. Harpur to do the same.

It may be added that a part of the evening was devoted to an exchange of opinions on the previous week's lecture on "Psychic Photography," and it now occurs to the reporter that notwithstanding the subject is taboo in these columns, without breaking it, several references might have been made to a remarkable fixture.

Well to repair the omission, the lecturer turned out to be a downright plucky old gentleman, and it must be admitted he got it rather hot—on reflection too hot in fact, even if many grew strongly antagonistic. On the other hand if he had been young it may be confidently said a red-hot poker would have been cool to sit upon. Again, he was very well able to take care of himself—for example, such a retort as "One fool at a time, gentlemen," even if it did not display great originality, at least indicated a robust spirit, and a nice sense of locality.

Mr. W. F. Slater and other Kodak representatives, with several outside photographic experts, were present, and an exquisite if puzzling touch was afforded by the lecturer when he, more than once, alluded to the "church of Slater." Possibly merely slips of the tongue, and Mr. Slater, on being subsequently approached, energetically denied being an archbishop in disguise, or anything appertaining to the cleric. But you never can tell, and members of the South London Society will be on the safe side if they in future address him as "Reverend." Frequent references were also made to Messrs. Kodak as being responsible for combination psychic prints, and if the audience had been non-photographic an impression might have been created that this firm were also in the business. Of course, it is not suggested any such intent existed.

As the evening wore on the dear old gentleman painfully realised the barren nature of the Croydon soil, but hope appeared on his countenance when at the end Mr. Harpur said he had been much interested, having personally experienced an astonishing manifestation in psychic photography. Undeterred by a vision of an editorial blue-pencil hovering in the air, we proceed to tell the tale. It transpired that Mr. Harpur was entrusted by a friend with six plates to develop which had been exposed during a séance. The expert took them into his dark-room, and four plates received the usual treatment, but nothing appeared, and then a loud crashing sound sent him flying panic-stricken into daylight. Summoning up his courage, he re-entered the dark-room and found some bricks had fallen down the chimney. "I then developed the remaining two plates with the same result," he concluded with an air indicating that an important advance in knowledge had been imparted. "I don't see any point in your tale at all," tartly said the naturally disappointed lecturer.

During the evening a letter was read from Mr. Nevil Maskelyne, also some letters from the lecturer, written more in sorrow than in anger. It was comforting to learn that he intended letting his experiences at Croydon pass from the mind as an unpleasant dream.

In last week's report his name was, by a printer's slip, given as "Wates" instead of "Coates."

Commercial & Legal Intelligence.

Legal Notices.—A first and final dividend of 3s. 3d. in the £ has been declared in the failure of Frederick William Gray, and Margaret Jane Gray, photographers, carrying on business at 11, Queen Victoria Street, Leeds, under the style of the Empire Studios. In the separate estate of Margaret Jane Gray, a first and final dividend of 20s. in the £ has been declared. The dividends are payable on May 24 at the office of Mr. G. H. L. Volana, Incorporated Accountant, 2, Albion Place, Leeds.

Notice is given of the dissolution of the partnership between Harry Hall and Frank Siggers, carrying on business as photographers, under the style of Hall and Siggers. All debts due to and owing by the late firm will be received and paid by Harry Hall.

NEW COMPANIES.

F. Brodrick, Ltd.—This private company was registered on May 9, with a capital of £1,000 in £1 shares. Objects: To enter into an agreement with F. Brodrick and to carry on the business of manufacturers of and dealers in photographic and kinematograph apparatus. The subscribers (each with one share) are:—F. Brodrick, 37, Heathfield Gardens, Chiswick, W., photo apparatus manufacturer; Mrs. G. H. Brodrick, 37, Heathfield Gardens, Chiswick, W. Directors: F. Brodrick, Mrs. G. H. Brodrick and C. B. Smith. Registered office: 50, High Street, Bloomsbury, W.C.

Adams Studios, Ltd.—This private company was registered on

May 7 with a capital of £3,000 in £1 shares. Objects as title. The subscribers are:—B. Park, 117, Adelaide Road, Hampstead, 600 shares; M. Adams, 83, Whiteknights Road, Earley, Reading, 900 shares. Permanent directors:— B. Park and M. Adams. Solicitors: Carpenter and Wilson, 4, Trafalgar Square, W.C.2.

Fulton Process (1919), Ltd.—This private company was registered on May 9 with a capital of £2,000 in £1 shares. Objects: To develop the Fulton Process in all its applications and to manufacture photographs, pictures, illuminated and other signs, theatrical scenery, etc. The subscribers (each with one share) are: A. A. Simco, 1, Bonsfield Road, New Cross, S.E.14, scenic artist; G. Wilkinson, 24, Caithness Road, West Kensington, W.14, scenic artist. Directors: A. A. Simco and G. Wilkinson. Registered office: 25, Caithness Road, W.

General Chemical and Pharmaceutical Co., Ltd.—This private company was registered on May 10 with a capital of £6,000 in £1 shares (3,000 preference). Objects: Manufacturers of and dealers in chemical and other preparations, photographic requisites, etc. First directors: R. S. Haskew, 103, Hampton Road, E.7, technical and research chemist; G. A. Bellwood, Bishop Norton, Lincs, yeoman. R. S. Haskew is permanent.

News and Notes.

Fire at a Studio.—In reference to the report which appeared in last week's issue of a fire at the premises of Messrs. Bayley's Studios, Ltd., 16, Tottenham Court Road, W., we are informed that the report was very greatly in error. We are glad to learn from Messrs. Bayley's Studios, Ltd., that the fire was not, as stated, serious; that it was in fact so slight that within a very short time of the outbreak having taken place the workroom was again being used for its customary purposes. Moreover, Messrs. Bayley's Studios, Ltd., state that the fire originated not through a carelessly thrown down light, but from a source outside the premises occupied by them. We cannot sufficiently regret that any misleading statements should have found a place in the report of the occurrence, and are exceedingly sorry if they have created any wrong impression of the conditions prevailing in the establishment of Messrs. Bayley's Studios, Ltd.

Messrs. Wahltuch, Smith, and Co. inform us that Mr. Albert Houghton has joined their travelling staff, and will begin his representation of them in the Midlands and South as from Saturday next, May 24.

Aerial Photography.—The Royal Photographic Society announces that at the last of the meetings to be held during the present session —namely, that on June 3—a paper on aerial photography will be read by Major F. C. V. Laws, of the Photographic Section, Royal Air Force.

Mr. George Hana, the well-known theatrical photographer of Bedford Street and ex-President of the P.P.A., underwent a serious operation some ten days ago. We are quite sure that his many friends will share our own pleasure that it has proved very successful and that Mr. Hana, cheerful as ever, is hopeful of quickly being himself again.

Photo-Micrographic Society.—The annual general meeting will be held on Wednesday, May 28, at 7 p.m., at King's College Laboratories, 62, Chandos Street, W.C., when there will be an exhibition of members' work, etc. Cards of invitation may be obtained on application to the hon. secretary, Mr. J. G. Bradbury, 1, Hogarth Hill, Finchley Road, Hendon, London, N.W.4.

To Newcastle Photographers.—A proposal has been made for the establishment of increased co-operation among photographers in Newcastle, and the initiation of a club or society for the purpose. Those interested, and desirous of combining their photographic activities, are invited to communicate with Mr. J. Nicol, at the de Bear Schools, Limited, Dial House, Northumberland Street, who would be able to provide premises and a dark room should a sufficient number come forward.

The Toronto Camera Club.—The Toronto Camera Club will hold its twenty-eighth annual exhibition at the Canadian National Exhibition, which opens on August 25 next and closes on September 6. The committee hope to receive a large representation of English pictorial work. Prints must be mounted but not framed, and should be sent by post to reach the honorary secretary, Mr. A. S. Goss, Toronto Camera Club, 2, Gould Street, Toronto, Canada, by July 19 next. An entry fee of 50 cents is charged.

Lancashire Society of Master Photographers' Exhibition at Blackpool.—The responses received by the hon. secretary have far exceeded the expectations of the committee, and it will be to the interest of every photographer within reasonable distance of Blackpool to visit this exhibition, which opens on Tuesday next, May 27, at the Art Gallery. The committee earnestly request the attendance of every member at the annual general meeting, which will be held at the Palatine Hotel, Blackpool, on May 27 at 2.30 p.m. prompt.

Affiliation of Photographic Societies.—The annual outing will take place on Saturday, June 21. It is being organised by the Croydon Camera Club, and the route will be from Waddon, near West Croydon, along the River Wandle, through Carshalton Park, to Wallington, where tea will be provided. Medals are offered by the Croydon Camera Club (*whose members will be ineligible to compete*) as follows:—(*a*) For the best uncontrolled contact print; (*b*) For the best bromide enlargement; (*c*) For the best print by oil, Bromoil, gum-bichromate, or other "controlled" process; and (*d*) For the best lantern slide. The United Stereoscopic Society also offers a medal for the best stereogram. Special permissions for members of the Affiliation to photograph in the Whitgift Hospital, the Archbishop's Palace, and the old parish church in Croydon, and also in private grounds on the Wandle route, will be obtained.

The Model Homes Exhibition, organised by the "Daily Express," which opened at the Central Hall, Westminster, on Monday last and remains open until June 14, has as its keynote the saving of domestic labour. Plans and models of cottages are a prominent feature of the exhibition, and Mr. Pemberton Billing shows a full-size four-roomed house built with a newly invented stove of his at the centre, providing heat in all four rooms, as well as in bedrooms and bathroom overhead. Among the many labour-saving appliances there are some which have an interest for photographers, for example, those for the heating of water. The portable water-heaters of the well-known firms of Parkinson, Richmond, and the Davis Gas Stove Company are shown, as well as two others quite recently introduced. One of these latter is a very neat water-heater of the coil type made by the Martin Engineering Company, 49, Theobald's Road, Holborn, London, W.C.1. The water is turned on, then the gas, and warm or boiling water obtained within a few seconds. Another is the "Helios" heater of the Wembley Heating Company, Wembley, London, N.W., an appliance which keeps three gallons of water always at nearly boiling heat, and automatically turns on the gas as hot water is drawn off. A space-saving device which may have its appeal to photographers having small workrooms is a table which, in the closed position, rests on a cupboard, but is readily drawn forward to provide a working surface formed by the cupboard and table tops which are caused to lie perfectly flush with each other. This is the S.O.S. table of Mr. L. Cancellor, of 301, West End Lane, N.W.6.

Quinine Backing for Plates.—A note in the "Pharmaceutical Journal," by Mr. F. J. Yeatman, is as follows:—In photographing a church interior, requiring a long exposure, the author was confronted with the usual difficulty of halation, and in the absence of backed plates or the ordinary backing solutions, sought a means of overcoming it. Surmising that a minutely crystalline deposit, brought into optical contact with the glass of the plate (by application in the form of a solution in a volatile menstruum), would prevent the reflection of light from the inner surface contiguous to it, the following solution was prepared:—

Quinine hydrochloride	60 grains
Absolute alcohol	1 oz. fl.
Dilute sulphuric acid	3 drops

A plain glass was taken, and half its surface on one side was covered

with the solution by means of a tuft of cotton-wool. When dry (a matter of a few seconds) it was dabbed over lightly with the solution, and again allowed to dry. Holding this horizontally (deposit downwards) near a window, the window-frames could be seen, reversed, accompanied by a dim fringe, presumed to be a secondary reflection from the lower inner surface of the plate. This fringe ceased on the part of the plate covered by the solution. Photographic plates were then backed in this manner, and yielded successful halation-free photographs, though taken under severe test conditions. The church interior above alluded to was given half an hour's exposure, and no halation ensued. The back of the plate is, of course, easily cleaned after development or fixing by means of weak acid.

A Wireless Photographic Receiver.—We read in an American journal that wireless messages can be received and recorded at a greater speed and with greater accuracy by means of a new photographic device invented by Charles A. Hoxie, an engineer of the General Electric Company. It is stated to be in use at the present time by naval engineers at Otter Cliffs, near Bar Harbour, Maine. The mechanism is based on comparatively simple electrical principles. A light mirror "flutters" in electro-magnetic tune with the minute electric impulses coming from the receiving antennæ. The duration and extent of the mirror's oscillations vary according to the dot, dash, or silence of the sending station. This mirror reflects a beam of light on a moving photo-sensitive tape. The tape, propelled by an electric motor, moves up and down through vertical tubes which contain the developing and fixing chemicals. It is then washed in running water, and is dried by electric heat, assisted by forced draught. Like the tape from a tape machine, the message pours into a basket. In rapid receiving there is an average of one word for every inch of tape, and receiving operators can read the record at a speed of 50 to 100 words per minute. The apparatus in operation at Bar Harbour is said to have repeatedly recorded regular traffic schedules ranging from 1,000 to 7,000 words without interruption, and at a speed of 40 to 45 words per minute. It is used in supplement to the ordinary type of receiving set. At the same time that the message is photographically impressed upon the tape a fleeting visible image of the signals can be seen on the ground glass of the machine.

Correspondence.

**** Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

**** We do not undertake responsibility for the opinions expressed by our correspondents.*

REVERSAL IN TANK DEVELOPMENT.

To the Editors.

Gentlemen,—With reference to your correspondent Mr. Binns re the reversal in tank development, we should like to add our experiences. We develop daily hundreds of films for amateurs in the long vertical tanks, and do at times come across the remarkable result referred to in your columns. Only last week we had a film nicely exposed vest-pocket Kodak size with seven negatives and one positive on it. The film was in no parts fogged nor in any way incorrectly handled, and the positive we had was as good and bright as any made with a lantern plate. It seems to us that it is the action of the light on the lens which reflects back. This is a very poor solution of the problem, but we cannot think of anything else.

As previously stated, the result is quite common on amateurs' films, and we should certainly like to see one of Mr. Binns' "positives" to see how they compare with the results we saw. If Mr. Binns remembers the exposure and treatment throughout, perhaps it might assist someone to solve the difficult problem which so far seems beyond hopes.—Yours faithfully,

A. Dymock, Manager,
for Arthur J. C. Lewis.

New Barnet, Herts.

FORTHCOMING EXHIBITIONS.

September 13 to October 11.—London Salon of Photography. Entries close September 2. Hon. sec., 5a, Pall Mall East, London, 1

Answers to Correspondents.

SPECIAL NOTICE.

In consequence of general reduced supplies of paper, as the result of prohibition of the importation of much wood pulp and grass, a smaller space will be available until further notice for replies to correspondents.

Moreover, we will answer by post if stamped and addressed envelope is enclosed for reply: 5-cent. International Coupon, from readers abroad.

The full questions and answers will be printed only in the case of inquiries of general interest.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

L. L.—We think no metal dish is immune from liability to give spots in hypo-alum toning, but we were recently told by a very large firm using this process that a tin dish is perfectly satisfactory. We mean solid tin, not tinned iron plate. We should view a lead-coated steel dish with great suspicion.

G. F.—Our opinion is that the removal of a business from one address to another is not a new retail business within the meaning of the Order. If we were you we should not worry to apply for a licence. If the matter should come to the notice of the licence committee we should say you have a defence.

M. N.—Your description of the proposed business is not sufficient for us to say definitely. If you are dealing with the general public you require to obtain a licence, but if your transactions are wholly with those in a given trade or business it does not come within the Order requiring a licence for a new retail business.

H. B.—The "Cannon" and other cameras for street photography came for the most part from America and the importation is now prohibited. The two best firms for you to apply to are Messrs. J. Hallowfield, 146, Charing Cross Road, W.C.2, and Messrs. Billcliff's Camera Works, Richmond Street, Boundary Lane, Manchester.

B. O.—Cards with wordings you mention used to be stock articles with the larger professional dealers, such as Houghtons, Kodak, and the Tress Company, although very likely they have dropped out during the war. Any of these firms could get tickets written, or you could have them done by a firm of shop-fitters such as Messrs. Wm. Potter and Sons, Ltd., 160-161, Aldersgate Street, London, E.C.

G. N.—Assistants who come within the Shops Act and are employed in a place which is a holiday resort, in which place the weekly half-holiday is suspended, can demand a holiday on full pay of not less than two weeks, which we understand, must be one holiday of two consecutive weeks. There is nothing in the Act requiring a double rate of payment for the holiday period if the holiday is not taken.

M. N.—It is impossible for us to give you any precise figures, but, roughly speaking, we think that you should have a capital of about £2,000 to start in a good way and to keep going until the money begins to come in. Most people start in a more modest way and "cut their coat according to their cloth." It must be borne in mind that all building and decorating materials, apparatus, etc., are at very high rates just now, and that the munition boom is over.

G. D.—1. On the whole, the best is to paint with ordinary bath enamel, though it will not last very long. 2. If a little olive oil run round the junction of the cell and tube does not ease the former, the only thing is to send the lens to the maker, who can separate the two parts on a lathe. 3. The address of Messrs. Valentine and Sons is Dundee. 4. Photochrom, Ltd., 7, Old Bailey, London, E.C. 5. From the Quta Company, 252-256, Haydons Road, Wimbledon, S.W.

O. N.—Two to three seconds can hardly be considered a long exposure, especially if you want soft lighting. You can greatly reduce it by bringing the sitter nearer the light; a foot or two makes a great difference You cannot get a better type of lens than the one you have, but the focal length is too short. Even for postcards, 8-in. is about the limit. The 2B Dallmeyer would be useful, as this works at f/3, and is about the right focal length for you. We do not know the current price new, but second-hand ones can be bought for from £5 upwards.

S N.—The alternative if you must dispense with a lamp requiring hand adjustment, is one of the focus half-watt lamps probably now obtainable again from the General Electric Company, Ltd., 67, Queen Victoria Street, London, E.C. Very likely one of sufficient power (they are made in a series of powers) will be too big for your lantern body, but that you can ascertain from G.E.C. A power suitable for enlarging up to, say, 20 x 16 is about 1,000 c.p. The other course is to fit up an illuminating chamber in which the negative is lighted by a light reflected from the inside white walls. Messrs. Marion, 3, Soho Square, London, W.1, make an appliance of this kind which can be fitted with incandescent filament lamps of any required power. It is a very good system.

P O. V.—1. On the average, unless the worker has much more than the ordinary skill, the results in development of different subjects together in a tank are better than by separate treatment in dishes. 2. Provided that exposures are reasonably correct, yes. With the necessary skill in development better results will be obtained from incorrect exposures by separate dish development, but in the absence of the knowledge of what to do with incorrect exposures, the batch system of development in such cases will give better results. 3. In the case of plates taken in a daylight studio, where exposure may be said to be reasonably correct, even if not exactly correct, the tank method certainly gives results which are as good, if not better, than those singly developed in dishes.

LIGHTING.—My studio is a temporary structure erected in my garden about three years ago and lit from the north. My next-door neighbour intends erecting a conservatory which will run parallel with studio and about two yards away. Will you kindly let me know if this will affect the lighting of my sitters in any way, and, if so, if I can by law prevent him building?—CONSTANT READER.

The conservatory will undoubtedly reduce your light, but the extent of this will depend upon the height. It may not be serious. You cannot do anything to prevent the erection of the conservatory unless your studio has been there twenty years. Try to arrange amicably, so that as little harm as possible is done.

R. F.—The address of an applicant for a patent is not ascertainable until the publication of his specification, which may be anything from six to eighteen months after the date of application. There have, however, been a fair number of specifications of patents for methods of stereo-cinematography published within the last few years. You will find these indexed in the annual index of the "B.J." under "cinematography, stereo." You can see these volumes in the library of the Patent Office, 25, Southampton Buildings, Chancery Lane, W.C., and in the same library you can also look up the actual patent specifications and ascertain from them the addresses of the patentees. This is the only suggestion we can make which appears to satisfy your requirements.

H. N.—Providing the generator receives the regular attention which is necessary the acetylene light is a very satisfactory one for enlarging and, of course, for bromide printing if the printer is of the type to take a flame light. Of the generators described in the catalogue we prefer the "Incanto," which is the manufacture of Thorne and Hoddle, one of the oldest firms in the acetylene business. We have no data as to the cost of working: a great deal depends as to whether the generator is in constant use or is out of use for periods during which, even with the best generators, there is deterioration of the carbide. We believe carbide is now readily obtainable. You can ascertain this easily from any local dealer in motor requisites. The only alternative light is the "Luna" spirit mantle lamp of Messrs. W. C. Hughes and Co., 82, Mortimer Road, Kingsland, N.1, fairly suitable for enlarging, but too powerful for bromide printing. If you can use neither gas nor electric current, we should think that a good central draught oil lamp is the best choice for the printer.

D. N.—Without knowing what your limit of size is, it is very difficult to plan such a dark-room as you suggest. Four feet by three by six high would seem the smallest size that could be worked in comfortably. This might be composed of two shallow boxes each four by three by nine inches deep. They could be kept apart by six jointed poles fitted into sockets in the boxes—one pole at each corner and two at the sides, so as to carry the sink securely. Opaque curtains fixed at top and bottom, except at one side where light flap would serve as door. For the enlarger a small conical bellows camera would be more portable and convenient than any shelf arrangement. Ventilation could be secured by trapped opening in the top and bottom. Such details as water supply, illumination, etc., you can doubtless fill in according to circumstances. You do not say in what climate you are going to work in. In a hot country you would probably find the above rather close. Do not entertain any idea of the old Wratten tent pattern. This was all right for collodion work, in which development only occupied a few seconds; for dry-plate and bromide work it would be unbearable.

G. A.—The pinholes are due either to dust of a particularly objectionable kind on the plates during exposure or to some grit on them during development. If the negatives were not so atrociously dense the pinholes would not be such a serious affair, and could be readily spotted out. But you ought not to get them if you are filtering the developer as you describe. Better try also boiling the water before making stock solutions of the developer and also boiling any water used for diluting them when making up the working developer. As regards a self-acting system of filtering, you can easily arrange this, or rather your local chemist can supply you with the apparatus in the shape of a twice-bent glass tube which serves as a syphon of water from any large vessel in which you have it, the flow of the water being controlled to the required degree of slowness for filtration by means of a rubber tube attached to it and more or less closed with a screw cap. Both of the negatives are horribly over-exposed. We should think you are using rapid plates, whereas you should have process or photo-mechanical plates in order to get satisfactory results in copying jobs of this kind.

The British Journal of Photography.

The Oldest Photographic Journal in the World.

PUBLISHED EVERY FRIDAY. ESTABLISHED 1854. **PRICE TWOPENCE**

TERMS OF SUBSCRIPTION, POST FREE.

UNITED KINGDOM.—One Year, 10s. 10d.; Six Months, 5s. 5d. Three Months, 2s. 9d.

CANADA ... ...
AUSTRALIA ... ...
NEW ZEALAND ... ...
SOUTH AFRICA ... ...
UNITED STATES OF AMERICA
SOUTH AMERICA ... ...
INDIA AND FAR EAST ... ...
CONTINENT OF EUROPE ...

One Year. Thirteen shillings (13s.), or 3 dollars 17 cents, or 18 francs 50 cents, or 9 rupees 12 annas, or 6 yens 30 sens.

FEDERATED MALAY STATES, BORNEO AND SARAWAK 5 dollars 57 cents.

HENRY GREENWOOD & CO., LTD., Proprietors and Publishers, 24, Wellington Street, London, W.C.2.

IMPORTANT NOTICE TO READERS.—Until further notice agents will supply the "B. J." to order only, as the high price prevailing for everything in connection with newspaper production prohibit the distribution of surplus copies for chance sales. It is therefore necessary in order to ensure the regular delivery of the "B. J." each week to place an order definitely with a dealer, newsagent or bookstall clerk, or to send a subscription to the publishers.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3082. Vol. LXVI. FRIDAY, MAY 30, 1919. Price Twopence.

Contents.

	Page
Ex Cathedra	289
Stereoscopic Photography	290
Practicus in the Studio. By Practicus	291
Cameras for Aviation Photography. By Spencer Leigh Hughes, M.P.	293
Calculations in Aerial Photography. By L. P. Clerc	295
Patent News	299
Meetings of Societies	301
Forthcoming Exhibitions	301
Commercial and Legal Intelligence	302
News and Notes	302
Correspondence— Masking in Enlarging—Reversal in Tank Development—The Systematic Toning of P.O.P.—Assistants' Wages	302
Answers to Correspondents	303

SUMMARY.

The "British Journal" for next week, June 6, will be a specially large issue, containing an additional number of articles and other features appropriate to the fact that an extra edition is posted by our publishers to photographers and others in all parts of the world.

In his article this week, "Practicus" deals with such general business methods in the carrying on of a photographic portrait business as can be the subject of definite advice. His recommendations are made chiefly in respect to the adoption of an efficient system of book keeping and to the advisable means which may be adopted for the collection of outstanding accounts. (P. 291.)

Mr. Spencer Leigh Hughes, M.P., formerly "Sub Rosa" of the "Morning Leader," has written a sketch of the introduction and development of photography in warfare, in the course of which he shows the large share taken in the production of aviation cameras by the Thornton Pickard Manufacturing Company. (P. 293.)

M. L. P. Clerc, of the French Aerial Photographic Service, has investigated mathematically certain important problems connected with the use of photography in the air, such as the estimation of the height of objects by the measurement of their cast shadows and the limit of angling which is permissible in taking photographs of a terrestrial region from an elevated standpoint. (P. 295.)

The aircraft camera, which proved to be one of the most efficient instruments used in the war, namely, that patented by Major F. C. V. Laws, is described in detail from the particulars given in the latter's patent specification. (P. 299.)

In a leading article, the first of a short series on the subject, we deal with the general attractiveness of stereoscopic photography, and endeavour to lay emphasis upon the things which appear to be chiefly responsible for its neglect by the great majority of amateur workers. (P. 290.)

The professional who makes a feature of copies of old originals can often attract a considerable bulk of business of this kind to his studio. (P. 289.)

Outdoor garden portraiture is a branch of work which should not escape the notice of those undertaking at-home portraiture. (P. 290.)

The publication in the autumn of an American annual of pictorial photographic work is announced. (P. 302.)

Metal spots on prints, registration of business names, titles on negatives, choice of studio lenses, and enlargement of large negatives are among the subjects briefly dealt with in "Answers to Correspondents." (P. 303.)

EX CATHEDRA.

Colonial, Last Hour. As announced in this column a week ago, the last day fixed by our publishers for receipt of advertisements to appear in the Colonial and Foreign Number of the "British Journal" of June 6 was yesterday, when the arrangement of the very great number of advertisement pages was carried out in its all but final form. As those who have had any newspaper experience are aware, there is always a small margin in the "make-up" of advertisement sheets, which consist of announcements of many different sizes, and therefore we may perhaps say on behalf of our publishers that, while no guarantee can be given that further advertisements can be inserted, any orders, accompanied by "copy," which reach them by the first post tomorrow, Saturday morning, will be accepted, subject to its proving possible to find a place for them in the final adjustment of advertisement spaces. This intimation is made in order that any firms who may have overlooked the opportunity which is offered in this widely distributed issue should not thereby be unrepresented among the very great number of concerns in the British photographic trade who have been eager to renew their offers to buyers abroad.

* * *

Special Displays. While passing through a provincial town recently we noticed a very interesting exhibit in a photographer's window. It consisted of a number of faded photographs of various descriptions, some copied the same size, while others were enlarged. The work was excellently done, and must have suggested to many passers-by that something could be made of similar pictures in their own possession. We fear that most professionals are apt to shirk this class of work, considering it not worth the trouble involved, but unless a man has a very good business indeed he cannot afford to throw away any chance of making an extra penny. We can understand why copies were unpopular when shiny surfaces were the rule, but now nearly all prints are made upon matt papers it is much easier to get satisfactory results, as not only is the grain of the original less apparent, but the working up is much easier. It is surprising what a good effect can be produced with lead pencil alone, working in much the same way as in retouching a negative. An error which is often committed is to use a soft pencil with a blunt point, when, of course, the lines will show. A No. 3 retouching lead with a medium point is more suitable. The work can be fixed and the gloss, if any, removed by steaming, after which any necessary brush work can be added. Unless the operator is a very skilful artist he will do well to avoid anything in the nature of drawing upon the print, or the finished picture will have a cheap look. Some very fine results can be obtained by carefully spotting and then putting a thin

tint of black oil colour over the whole surface, wiping out high lights where required. This can easily be done with a little practice if a suitable medium be used.

* * *

Garden Portraiture. Many photographers who occasionally undertake home portraiture are apt in the case of feminine sitters to overlook the garden as a setting for fine and pleasing studies. We were recently looking at several garden portraits taken by a professional friend of a lady client among the flowers in her own garden that gave great satisfaction to all concerned, and for technical excellence and artistic merit left nothing to be desired. One word may be added on the technical side of such work. The photographer should take care that his pictures are of correct colour-rendering. It is certain that the lady sitter who desires to be photographed in her garden is a garden lover, and will probably resent her favourite yellow W. A. Richardson being rendered in the print as of ebony black hue. Therefore, it is important that panchromatic plates with a light screen, say, a K2, be employed for such work. With regard to posing and selection of the background, we need only add that the artistic perceptions of the operator are called forth in fullest measure, and shown to the highest advantage.

STEREOSCOPIC PHOTOGRAPHY.

I.—Introductory.

The time is well within the memory of many of us when the stereoscope was to be seen in every drawing-room: now it is rarely met with at all, and it seems to be regarded as an obsolete toy which had a charm in bygone times, but has long lost its attractive spell. There are several reasons for this change of fashion. In the first place, the instrument is inevitably associated with the Early Victorian period, and the present generation has very little sympathy with the fashions of that day. Secondly, the graceful box-shaped stereoscope has long been superseded by the much more serviceable Holmes form of the instrument, and unfortunately this contrivance, though so admirably adapted for its purpose, would be a most ungainly accessory in a modern drawing-room. Then, too, it is to be feared that a certain amount of prejudice against the stereoscope has been created by the deterioration of the stereograms. There are certain optical principles which require the closest attention if the instrument is readily to give the effects it is designed to produce. Indifference to these means that those effects are only imperfectly seen, and even then at the expense of a good deal of eye strain and discomfort, results which naturally enough tend to destroy that enthusiasm with which the wonders of the stereoscope were hailed when the invention was a new one, and when the slides were prepared with a more rigid regard for the exact essentials of perfect effect.

It is certainly a little disheartening to observe how much carelessness has crept into the production of commercial stereograms and how frequently the most elementary knowledge of the principles involved seems to be wanting. One frequently sees slides in which the pictures to be combined are separated by a full three inches or more. To anyone constantly accustomed to using the stereoscope this may present no serious obstacle to a due combining of the two; but to anyone looking for the first time it would almost certainly involve strain and patient effort before the blending could be effected. Worse technical defects than this are apt to occur. Not infrequently photographic prints are even mounted reversed so as to produce pseudoscopic instead of stereoscopic effects. One actually hears sometimes even a skilled photographer disputing as to whether it really makes any difference which of the pictures is mounted on the right and which on the left, while, so far has the science of stereography lapsed into oblivion, that many a modern photographer, professional as well as amateur, is quite unable to explain why the prints from a stereo negative require reversing before being mounted. As a matter of fact, the writer, when speaking to a professional photographer on this point recently, was shocked to find that he was not only ignorant that any transposition was needed, but had actually mounted considerable numbers for a customer without ever transposing and without any consequent defect having been observed by his customer in the results!

If, however, from these or any other causes stereoscopic photography has gone out of favour or fashion, there is

A striking subject in the Stereoscope.

no question that a revival of interest in it is worth securing, and to that end all that is really indispensable is a little care and attention in regard to technical details and some comprehension of the general optical principles involved. Given only that the work is properly executed, no amount of familiarity with the results can entirely deprive them of the charm and fascination which they possess to those who see them for the first time.

Moreover, in these times of research there are many new applications for stereography that are of interest and value, and the stereoscope may be made a revealer almost comparable with a microscope or telescope. In astronomy and in radiography there are immense practical advantages in stereoscopic photographs, and there are other branches of science in which the value of stereograms is not less remarkable. To the artist, too, the presentation of natural objects in their true planes is a most instructive phenomenon, and the practical value of it to him would perhaps surprise him, if he would be at the pains to acquire the very easy knack of seeing stereoscopically without an instrument, as he would then find in the stereogram a model to all intents and purposes three dimensional, and one from which he could actually copy as from nature itself.

To achieve the requisite technical exactitude to render stereography once more popular and pleasing all that is really required beyond the usual essential of common-sense is a thorough realisation of the principle on which the phenomena of the stereogram depend. Briefly expressed, this principle is simply as follows: Our impressions of solidity and planes of distance are derived from the mental effect produced by the two simultaneous retinal pictures of our eyes. The psychological reasons for this need not be theorised further than to say that long and uniform experience teaches us by association of ideas to infer solidity as the signification of these simultaneous dual retinal images. This being so, it is obvious if we can provide exact pictures of such dual images, and place them so that they present to the two eyes views exactly corresponding to two direct retinal images of the same scene, that inference of solidity cannot but take place. It matters not whether the two images are hand drawings, traced perspectively from the point of view of two eyes, or whether they are photographs taken with the twin lenses of a stereoscopic camera. The instinctive illusion of solidity must necessarily be caused in either case. As a matter of fact, it is interesting to remember that Wheatstone's original stereoscope, though invented in the time of Daguerreotypes, was not at first used to combine photographs, but only geometrical drawings of solids.

The object of the present series of articles is to give a few simple hints on the general principles of this rather neglected branch of photography, and if in doing so old ground has to be re-trodden, those who are familiar with it will perhaps exercise forbearance, realising that to many others the subject is one that has been hitherto somewhat overlooked, to their considerable disadvantage as photographers and artists.

C. E. B.

PRACTICUS IN THE STUDIO.

[Previous articles of this series, in which the aim of the writer is to communicate items of a long experience in studio portraiture, have appeared weekly since the beginning of the present year. It is not thought possible to continue the series to the length of that by the same writer which ran through the "British Journal" some years ago, but if any reader among the younger generation of photographers, and particularly those engaged as assistants, has a particular subject which might be dealt with, his or her suggestion will be welcomed. The subjects of the previous articles of the series have been as follows:—

A Talk About Lighting (Jan. 3).
The Camera and the Lens (Jan. 10).
Managing the Sitter (Jan. 17).
Backgrounds (Jan. 24).
Studio Exposures (Jan. 31).
Artificial Lighting (Feb. 7).
Printing Processes for Portraiture (Feb. 14).
Studio Accessories and Furniture (Feb. 21).
The Surroundings of the Studio (Feb. 28).
Studio Heating and Ventilation (March 7).
The Postcard Studio (March 14).
The Printing-Room (March 21).
About the Reception Room (March 28).
Home Portraiture (April 4).
Portable Studios (April 11).
Copying (April 18).
Handling the Studio Camera (April 25).
More About Lenses (May 2).
Enlargements (May 9).
Advertising the Studio (May 16).
Mounts and Mounting (May 23).

BUSINESS METHODS.

No photographic business is too small for some sort of book-keeping to be unnecessary. It need not be elaborate—in fact, the simpler the style adopted by anyone not skilled in office work, the more likely it is to be carried through. I am aware that it is possible to carry on business, and even to make a fortune, without keeping a note of any transaction; in fact, I can quote one instance of a man who could neither read nor write, and who had to Pelmanise the value of bank-notes and cheques by the number of times he folded them; yet he could afford a pint of Heidsieck with his lunch daily, and that without impoverishing himself; but he was in the greengrocery trade, which I think must be somewhat more lucrative than photography.

You may keep your accounts either in books, or, if you are progressive, upon cards; but in either case the method is the same, the bare essentials being a day-book, a cash-book, and a ledger. In the day-book should be entered at the time of delivery all goods sold—that is to say, that when a dozen cabinets are sent home we should make an entry something like this:—

June 3.—Mrs. R. W. Tomson, 87, Belvedere Gardens.
1 doz. Cabinets, Bromide, £2 2s.

If the price has been paid in advance, this entry should have a distinguishing mark, so that a separate account need not be opened, the item being posted into the ledger under the heading of "Cash Sales." If only a deposit has been paid, or the whole amount is owing, a personal account must be opened in the ledger. In either case the cash when received must be posted opposite the entry. In the case of a cash sale the cash will naturally have to be posted first, and the entry will appear thus until the goods are delivered, when the amount charged will be filled in; until then the ledger entry will appear thus:—

A		B	£	s.	d.	C		D	£	s.	d.
	Mrs. R. W. Tomson					May 1	By Cash.....		2	2	0

Columns A and C give dates of delivery and payment. B and D are for the page—or, as it is usually called, folio number—of the day-book and cash-book respectively. By this means we have an effective check upon errors, as if there is any discrepancy between the two amounts it can at once be inquired into. If Mrs. Tomson is a customer to whom credit is given, the account would appear thus when paid:—

Mrs. R. W. TOMSON, 87, Belvedere Gardens.

A		B	£	s.	d.	C		D	£	s.	d.
June 3	To Cabinets..	14	2	2	0	June 15	By Cash.....	9	2	2	0

If, however, at the end of the month the cash has not arrived, it is at once apparent and a statement of account is forwarded; when this is done, the actual date of doing so should be noted in pencil under the amount, thus indicating that it has not been overlooked.

The cash book is as important in its way as the ledger. On the left-hand page is entered all the money which is received and on the right-hand one all that is paid; thus:—

		B						C			
June 5	Tomson, Mrs.		2	2	0	June 1.	Greenfield & Co.		14	17	6
	Jones, A. J.		1	15	0		Wages		9	15	0
	Green, Miss A.		3	13	6		Gas		4	16	7

Columns B and C are for the ledger folios on which the amounts are posted.

It will be noticed that there is no connection between the two sides of the cash book, and that it affords no indication of the progress of the business; for this we must go to the ledger which not only shows what has been paid or received, but what is owing to and by the business. I have mentioned only one ledger and this is sufficient for a small business. In larger concerns there are always two, one called the "sales" ledger for customers accounts, and the other called the "bought" ledger for goods purchased and money paid for the conduct of the concern, such as stockdealers, repairs, wages, gas, rates and taxes and other expenses. In all cases where the account is with a firm supplying goods or doing work it is what is called a personal account, but it is a good plan in addition to keep impersonal accounts as well, that is to say, that not only should we enter to the credit of the Empire Plate and Paper Co. an item of £25 17s. 6d., but also to the debit of another account headed Plates £15 17s. 6d., and to one headed Paper £10. Such accounts are memoranda only, but serve to show exactly how much has been expended upon these particular lines during the year or other such period as may be decided upon. In many large businesses this idea is carried out very elaborately, a special book being devoted to it. One firm with which I am acquainted can in this way ascertain day by day the expenditure on plates, papers, chemicals, packing, repairs, apparatus and many other items and any rise or fall in cost as compared with the quantity of work produced has to be accounted for. This is unnecessary for the small trader who carries much of this information in his head, but directly personal supervision of every detail in the business becomes impossible it is of the greatest value.

As far as getting invoices posted into the bought ledger or into that section of a single ledger for both bought and sold accounts there are two methods in general use, one being to enter them into a kind of daybook called the "bought journal" for which they are posted in the same way as daybook entries, and the other is to paste the actual invoices into a book and to post direct from this putting the ledger folio on the invoice. The latter method is the easier, but it is somewhat clumsy; moreover it does not permit of the total purchases being readily added up. I am sorry to say that many photographers I know are very lax in checking their accounts, some even taking the statement as correct and not troubling to compare it with the invoices, entering it *enbloc* in the ledger to save trouble. The most honest firms make mistakes, the commonest one being to make a duplicate charge for the same article. This is easily detected if the invoices are carefully checked when they come in and initialled if correct.

The object of book-keeping is not only to avoid loss and prevent mistakes, but to give the trader accurate information as to how he stands financially, and in the case of disaster such as bankruptcy, the omission to keep proper accounts is regarded by the courts as a serious matter. If a question of compensation arises, as in cases of compulsory acquirement of premises for public improvements or by a railway company a proper set of books forms a firm basis for a claim, while in many cases the income-tax surveyor insists upon a proper balance sheet being submitted before he will pass a return of profits for assessment. It must not be forgotten that nearly everything connected with a business undergoes deterioration year by year, lenses and cameras backgrounds and furniture do not remain long at their original value, and the trader is entitled to write off a certain percentage of this before he arrives at the amount of his net profits for the year. An omission to do this gave serious trouble in one case. On closing down a branch the greater part of the plant was sold at auction, realising only £25, the original cost being £300. On £275 being put down in the balance sheet as deterioration, the surveyor suspected fraud and made a searching investigation before he allowed the claim. If this had been spread over, say, ten years, it would not have excited comment.

I would strongly advise anyone having a photographic business with a turnover of more than £1,000 a year to have his books audited and a proper balance-sheet prepared by a professional accountant annually, as this is not only useful, for the reasons already given, but also furnishes very useful information to the proprietor himself. The bank balance is not an unfailing guide to one's circumstances. Outstanding liabilities and assets have also to be considered, and these may put quite a different complexion upon things. When a business has branches connected with it, very careful supervision over expenditure is necessary. For example, it should be clearly ascertained whether the quantity of material used bears the same proportion to the quantity of work turned out as in the head establishment, which is presumably under the eye of the proprietor himself. It is not unknown for a manager to execute orders on his own account, using his employer's material, and in other cases to waste plates and paper by careless working; in one recent instance a reduction of nearly £20 a month in cost of material was made by a change of management, the gross takings being actually increased. This would have been discovered at an early stage if proper accounts had been kept.

The collection of outstanding accounts is a matter requiring some tact, the main object being to use just as much pressure as is possible without offending the customer. I do not say *never* resort to county court proceedings, but do so as rarely as possible. I have known photographers and others with slipshod methods who have taken out a long list of old debts and sent it to their solicitors or a debt-collecting agency for proceedings to be taken. Such an action shows slackness in everyday routine. If proper discretion be exercised in granting credit, and accounts regularly rendered, few doubtful debts will be made. I have found one or two little dodges useful in bringing slow payers up to the mark. One is to add a charge for postage of previous applications to the original amount; that is to say, if the bill has been sent in six times, on the seventh application is added in red ink: "Postage of previous applications, 9d." This generally brings the money, but usually minus the postages. Another useful ruse is to make a considerable error (?) in the amount; that is to say, for a debt of £3 10s. to ask for £5 10s. This usually brings

a rather sharp letter of correction enclosing a cheque. As a last resource before threatening action, I have sent a letter asking if any error in the account stood in the way of payment, or if a remittance had been sent and lost. With this was enclosed a stamped addressed envelope for reply, and this three times out of four came back with the desired remittance. These little hints will, I hope, not be so much needed by the portrait photographer, who can usually get payment at the time of sitting, as by the outdoor and commercial man who generally has to trust his clients.

I may add that it is generally advisable, if court proceedings are contemplated, to put the matter into the hands of a solicitor or debt-collecting agency. Very often the solicitor's letter of application will suffice, and in the event of the case going into court all expenses have to be paid by the defendant. One vital point in such cases is proof of delivery of the goods; one cannot sue for goods made and not delivered. If for any reason a customer chooses to refuse acceptance, say, of an enlargement after it has been tendered at his address, there would probably be ground for an action providing that the order can be proved to have been given; but as a rule it is possible actually to deliver the goods and let the customer return them if he chooses.

When either buying or selling, unless the transaction can be completed on the spot, it is desirable to ask for or to give an estimate of cost. This will often obviate unpleasantness. If alterations or repairs to premises or apparatus are needed, it is satisfactory to know just what you ought to get for your money, while in the case of doing work such as the production of any special picture which is not on your price list, it is equally useful to have the price fixed. I have suffered from this by such shabby tricks as having the customer say: "You have charged me three guineas and a half, and you told me it would cost two guineas and a half, and I certainly will not pay a penny more." What is to be done? It is either keeping the picture at a dead loss or losing the guinea; for even if one were disposed to take it into court, it is only one party's word against the other.

I have not in this talk touched upon such subjects as card indexes, registration of orders, and work sheets, as these will require a separate article to deal with them adequately.

PRACTICUS.

CAMERAS FOR AVIATION PHOTOGRAPHY.

[We are gradually getting the whole story of the development during the war of aerial photography. The design and production of lenses have had their chroniclers in the representatives of the firms concerned. And now the Thornton-Pickard Company, who were the very first and, as we understand, the very largest producers of cameras for military aerial work, are fortunate in having as their historian Mr. Spencer Leigh Hughes, M.P., by whom, for once in a serious vein, the article which we reprint below has been written, and is issued as an introduction to the catalogue of Thornton-Pickard manufactures just issued. The tale is not yet complete, for we have in type a contribution by Mr. Colin M. Williamson which will show the share taken by this inventor and designer in providing apparatus for the detection of the enemy's works and movements. And even then we shall not have dealt with contributions, by no means inconsiderable, of the Allies. M. L. P. Clerc, to whom the working out of a number of scientific problems involved in aerial photography is due, has kindly sent us copies of his papers, translations of which we are publishing in due course. EDS. "B. J."]

THE phrase "aviation photography" would have puzzled nearly everyone a very few years ago. To us to-day it includes the notion of flying, of taking photographs from a machine moving quickly at about a mile and a-half above the earth, and doing this in war time, picking out and revealing all sorts of unsuspected details in the enemy's area with decisive and, so far as the enemy was concerned, deadly results. All this is accepted as a matter of course to-day, but in this form of enterprise, as in all others, such as ironclad vessels on the sea and railways on the land, the pioneers had a hard task at the start.

So far as aviation photography is concerned, two of the pioneers were Lieut. C. D. M. Campbell (who is, unhappily, no longer living) and Lieut. J. T. C. Moore-Brabazon, now a Lieut.-Colonel and Member of Parliament for Chatham. I have heard him tell the House of Commons how he and some other hopeful enthusiasts went to the War Office in 1911, barely three years before the war, offering to provide a couple of aeroplanes if the authorities would allow them to be used experimentally at the Army manœuvres of that year. The officials declared that aeroplanes were not wanted for war purposes, and that no one could see any use for them, and even in 1915, after months of war, when photography was offered as an aid for reconnaissance purposes, the authorities, while being good enough to say that the photographs taken were "pretty things," once more declared that no one could see any use for them from a military point of view.

In fairness to the War Office, I ought to say, in passing, that the Admiralty was just as disinclined to have anything to do with these new proposals. It is well for us that our pioneers are not easily discouraged, or, if discouraged, not stopped in their determination to keep pegging away, and the struggle against scepticism, indifference, and prejudice was continued.

There was a young officer, who is now a famous general, who used to go about with his pocket full of photographs, handing them out as if they were commercial travellers' samples, with the pathetically modest suggestion that perhaps they might be found useful. And so the game continued until one day in February, 1915, certain photographs of the enemy's position were taken with a miserable makeshift camera, but the result made the authorities sit up and take notice.

All sorts of unsuspected things were revealed, such as unknown trenches, while sham trenches were shown to be shams. The staff got busy, the general vowed he could capture the enemy's position next day, and he did so with complete success, taking many prisoners without one casualty on our side. After that, aviation photography was recognised as an art that can produce results other than more "pretty things."

One of the first difficulties to be tackled was the flat, hazy, and vague appearance of pictures taken from a mile and a-half up, say, in Flanders. What these pioneers wanted to do was not only to eliminate lack of contrast, but, if possible, to emphasise contrasts, and this they soon did. For instance, they turned their cameras over dark, ploughed fields or great brown stretches of mud, across which ran paths mud-coloured like their surroundings, and in the photographs these paths stood out as white lines. Again, German guns, so cunningly disguised as to be quite invisible by the keenest-eyed observer, were picked out and revealed by the camera. By this time it was obvious that a new method of war of enormous value had been discovered, and now it is only fair to say that General Headquarters began to get busy in a manner worthy of the best British traditions.

The two young officers, Lieutenants Campbell and Moore-Brabazon, were sent hurriedly over to England with instructions to get cameras suitable for the purpose. Directly they reached London they telephoned to the Thornton-Pickard Manufacturing Company, Ltd., of Altrincham, asking for a representative of the firm to be sent to London in order to discuss the designing and making of a camera for aviation photography. Once more there was no delay. Mr. R. Hesketh, the secretary of the company, reached London the same night—a Friday—and on Saturday morning he and the two officers were hard at work discussing the problem. Mr. Hesketh hurried

back to Altrincham, work was at once begun, and within three days the first British aviation camera for war purposes was designed for the Royal Flying Corps, and was ready for examination by Wednesday, or, as I have said, in the record time of three days.

Moreover, they had to carry out quite special suggestions which the experience of the officers enabled them to give For instance, it had been found that the vibration in a flying machine is so enormous that it tends to loosen all ordinary screws. The makers, therefore, substituted metal thread screws, secured with screw-nuts, instead of the usual wood screws. As I have said, the camera was ready for examination by the Wednesday, one or two minor alterations were made, it was delivered to the War Office, and was hurried over to France on the Saturday—a fine bit of work, reflecting credit on both the military and manufacturing authorities. Moreover, when once the War Office had recognised the usefulness of this development, they extended it enormously.

At the start it employed but the two lieutenants and a sergeant, now Major Laws, who to-day holds a high position at the Air Board. Before long there were many thousands of men connected with the photographic section of the Royal Air Force. The first cameras sent out were effective and useful, but in all inventions and discoveries there is room for improvement, and the enthusiasts who had started this memorable movement were not men who would be satisfied with anything that was second best.

In a very short time one type of camera superseded another, each being a marked improvement on its predecessor. In the summer of 1915, Mr. Gray Pickard, the manufacturing company's general manager, was requested by the War Office to go out to the General Headquarters of the Flying Corps in France to discuss the subject of aviation cameras still further. The result of these consultations was soon seen in further improvements, and highly effective cameras were made in very large numbers. They were in use not only on all the war fronts, but also employed for training purposes in all home, Colonial, and Allies' camps. Though, as I have shown, there were some of the authorities at the outset who were blind to the advantages of this new discovery so far as war purposes were concerned, those advantages were so obvious directly the invention was given a fair chance that aviation cameras were in demand everywhere, right up to the end of the hostilities.

It used to be said that Wellington owed much of his success as a soldier to the fact that he could by intuition or genius make out what was going on at the other side of a hill. And ever since war has been known in the world, commanders have always been anxious to find out what the other fellows were doing.

The Germans certainly made great efforts to deceive our side by all sorts of methods and devices, but they were foiled to a great extent by these mechanical detectives, as they may be called. It was in vain that they moved their trenches, as they did continually, and in vain, too, that they tried by all sorts of means to disguise or hide their guns, for the aviation cameras revealed and recorded all their moves and tricks. They were in a real sense of the word the eyes of the Army. Nor should it be supposed that they were useful only in revealing the secrets of the enemy, for photography has been of enormous assistance in the recent war to our artillery. It is a fact that every gunner thinks he knows exactly where his shot goes, the fact being that he does not. Such a remark from a layman and civilian like myself would be presumptuous if made only on my own authority.

The statement has been made by Col. Moore-Brabazon, and confirmed by many soldiers; indeed, the Colonel has put the matter on record in this way: "It was not until we actually showed the marks made by the shells, by photographs, that they were practically forced to use aeroplanes for firing heavy guns. On that matter I remember well an officer flying over Ypres salient and sending back by wireless a curious message, 'that if anyone was firing at the centre of the lake'—the name of which he gave—'he was hitting it.'" No one will to-day deny that aeroplanes have played a great part in directing artillery fire, but from the above quotation it seems that it was photography from above that really convinced the gunners that they were wrong in supposing they knew where their shots were going. So that here once more the aviation camera helped our cause most decidedly.

Nor have I even now mentioned all the advantages resulting from the use of this ingenious invention, as all sorts of useful knowledge has been obtained in this way. Long before the end of the war it became one of the chief features of war in the air and down on the land, too. For as it was possible to know accurately the height at which photographs were taken, and the focal length of the lens used, the photographs could be made into scale plans, and it was from these plans that our attacks on the German defensive system were made. And in this way a method of producing what were dismissed as merely "pretty things" came to play a decisive part in the grim realities of war.

And now let me tell the reader of another development of aviation photography, so ingenious that it might well appear incredible had it not been used in practice, and used with remarkably successful results. To begin with, I may explain that while a man may be a very good machine gunner on the ground, he may be a very poor shot with a Lewis gun in an aeroplane, hardly ever making a hit. That is to say, he would be of no use so far as injuring the enemy is concerned, and at the same time he would inevitably be himself shot down sooner or later. But it was virtually impossible with an ordinary machine gun to prove whether a man was or was not a good shot from a flying aeroplane. It was then suggested that a camera just like a Lewis gun should be made in order to train flying machine gunners, or to find out those who could not be trained and to weed them out in the interests both of themselves and the service.

I have seen and examined one of these machine gun cameras, known technically as the Mark III. Hythe gun camera, and I may say that even experienced machine gun officers have supposed, until they have examined the invention, that it was an ordinary Lewis gun. The fact is, that in appearance and in operation it and a Lewis gun are identical, but instead of firing a bullet the gun camera takes a photograph. There are many advantages in this. To begin with, as the process of firing a Lewis gun is exactly the same as of photographing with the gun camera, the man who is taking the photographs is at the same time learning how to use a Lewis gun. But there are more important advantages than that, for the gun camera shows and records on the film how many hits the man would have made had he been firing bullets at the aeroplane which he is photographing.

There are ingenious little devices, somewhat of the nature of telltale clocks, that make it impossible for a man successfully to tell a too flattering tale about his performances in the air, especially in regard to how many drums of ammunition he has used. Not the least useful purpose served by working the gun camera is the fact that it teaches men how to judge and estimate correctly distances in the air. It is very difficult for a man to feel sure as to how far off an enemy aeroplane is, and yet it is of vital importance that he should learn to do so. Machine guns on aeroplanes are sighted for point-blank firing, and obviously if bullets are fired point-blank at an enemy who is just out of range the bullet misses because it begins to drop, however accurate the aim of the aerial gunner may have been.

In connection with this I may mention a favourite device of the enemy in the earlier days of aerial warfare. I am one of those who think that in many respects we gave the Hun undeserved credit for astuteness and especially for accuracy as a student of psychology and mentality. For instance he blundered miserably in his view that our great Dependencies and Dominions would say that the war was a European affair and would refuse to help. Also he was wrong in supposing that India would rebel. It was acutally believed by Germans of high positions that suffragette troubles in this country would paralyse us by keeping our army at home. But in one of his calculations the Hun was right. He knew he could rely on our young airmen being "sports" and ready to take risks, and the Hun traded on that knowledge with some success. For he would keep just outside point-blank range until the British aviator had emptied his magazine, and then, before there had been time to change the drum, the German would dash in and bring down his enemy. Things happen very quickly in the air, and a few seconds makes all the difference. Many a man on our side lost his life in this way, and it became imperative that some means should be discovered of teaching this important lesson of how to judge distances in the air. The gun camera does this, and soon after the authorities had given what was at first a reluctant consent to have it used for training purposes a very great improvement in the shooting of

British aviators was noticed. Indeed, it was so remarkable that it could not be dismissed as a mere coincidence.

Before long this Mark III. Hythe camera was recognised not only by our Air Force, but by the air forces of all our Allies as essential for training flying men, and large numbers were supplied to France, Italy, America, and other Allies, as well as to our own aviators. The demand for these machines was so great, and went on increasing right up to the day the Armistice was signed, that the Thornton-Pickard Manufacturing Company had to give up making their ordinary types of cameras and concentrate entirely on this sort of work for the Air Ministry. Those who are capable of forming a definite opinion that is worth anything on this matter, declare that this Mark III. gun camera was the main factor in the supremacy of our men in the air, and for their absolute dominance over the enemy. In the realm of war, as elsewhere, the proof of the pudding is in the eating, and those who suggested the use of the gun camera as a means of improving our airmen's shooting could and did point out that as soon as the experiment was tried the hoped-for results were obtained.

I regard the history of how the arts of flying and of photography were developed and united in the war, and how they came to be chief factors in the war being won, as really a fascinating tale that has the merit of being true. And I also think it is a record that does credit to our race. It is certainly a mistake to despise your enemy, but it is also a mistake to over-estimate his gifts and to depreciate those of your own side. We have beaten the Germans in nearly every invention or development of engines of war. Even in regard to poison gas, which we had no intention and no wish to use, and the use of which was forced on us, ours was more deadly than theirs. But it is in the realm of aviation photography that our supremacy has been most conspicuous.

Indeed we have excelled not only the enemy, but have been able to give a lead to all our Allies in this respect. It is true, as I have shown, that at first naval and military authorities were hostile to both flying and photography as a means of war, but let us not make too much of that. I may confess that about twenty years ago I wrote an article to show that flying machines heavier than air that would rise to a great height and would remain up a considerable time and go far, would never be made, because they could not. And a much greater authority than I am, the late Lord Kelvin, who could write after his name G.C.V.O., M.A., LL.D., D.C.L., F.R.S., F.R.S.E., and D.L., and was a Professor of Natural Philosophy, with honours from nearly every university in the world, said just what I said, that the things were impossible. Fortunately for mankind our inventors, discoverers, and pioneers are men who, in the language of the old hymn, "laughs at impossibilities and cries it shall be done." Thus we may forget the original hostility of a few in connection with aviation photography and recognise rather their promptitude in scrapping their old notions, and their eagerness to help forward new inventions which had been proved to be practicable. From that point the history of effort, experiment, improvement, and in the end of triumphant achievement, is pleasant reading.

The persistence of the young officers, the energy and skill of an English manufacturing firm, masters and men alike, are refreshing incidents in the record, and it is well to dwell on them, because, as I have said, there are too many people prepared to enlarge gloomily on our supposed decadence as a race, or at least they were inclined to do so before the war. Few of us in this country had any notion as to what was going on in that memorable week between the Saturday, when Lieuts. Campbell and Moore-Brabazon met and consulted with Mr. Hesketh, the secretary of the Thornton-Pickard Manufacturing Co., Ltd., of Altrincham, and the following Saturday, when the first British aviation camera was taken to France. Perhaps, if we had known we might not have appreciated the importance of the affair—but in those seven days something had been schemed, explained, made, altered, and sent to the Front, that as much as any other one thing made the overthrow of the enemy absolutely certain. When I first met Mr. Hesketh in a club in London he came in armed with a Mark III. Hythe gun camera, and when he took it from the case I thought it was a Lewis gun. Thus when he began clicking away, as if firing it, I was scared and felt tempted to get under the table. But when he opened what seemed to be a deadly weapon and explained and exhibited its mechanism, my alarm was changed into admiration approaching fascination. For here was an invention that I really believe gets as near to perfection as any human invention can. It contains more than 200 separate parts, and yet anyone can carry one with ease.

I have already shown how supremely important aviation photography has proved itself to be in the war, and it is pleasant to know that it may be, and as I feel certain it will be, equally useful for the purposes of peace. It can be employed for surveying and preparing plans and maps of remote districts, difficult to travel through, but easy to fly over. By its aid water-ways, sites for harbours or docks, and indeed all the contour of a country can be observed and recorded, and what is more will be recorded with absolute accuracy. Thus those who are responsible for aviation cameras may have the satisfaction of knowing that not only have they "something attempted, something done" for their country and its cause in war, but they have also produced instruments for adding to the knowledge, the prosperity, and therefore the happiness, of mankind in peace.

SPENCER LEIGH HUGHES, M.P.

CALCULATIONS IN AERIAL PHOTOGRAPHY.

[The following are short papers by M. L. P. Clerc, representing calculations worked out by him for the French Aerial Photographic Service in the course of his connection during the greater part of the war with that body. We owe to the kindness of M. Clerc the use of his French manuscripts and of the illustrative diagrams. EDS. "B.J."]

LOWERING OF THE HORIZON LINE IN PHOTOGRAPHS TAKEN FROM HIGH-VIEW POINTS.

In panoramic photographs taken from elevated positions, and particularly in photographs made from balloons and aeroplanes, the horizon line of the landscape does not coincide with the principal horizon line—that is, the intersection of the plane of the negative and the horizontal plane containing the nodal point of emergence of the lens—but below this line there is an apparently lower position of the horizon, the depression being greater as the view-point is higher and the focal distance of the lens is greater.

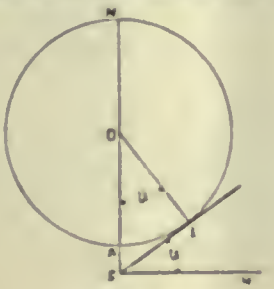


Fig. 1.

In fig. 1 let O be the centre of the earth, and S the supposed view-point at an altitude $S V = h$ above the mean surface of the earth. The apparent horizon is the intersection of the plane of the negative and the tangent plane S T, drawn to the sphere from the point S. The principal horizon plane is S H, drawn from S at right angles to the radius of the earth's circumference, S O. If we call n the angle included by these two planes, and if F be the focal length of the lens used, the depression, d, of the horizon line on the negative will be measured by

$$d = F \tan. n.$$

Produce the radius, S O, to the antipode, N, and express the power of the point, S, relatively to the meridional circle of radius, r:—

$$S T^2 = S V + S N = h (2r + h).$$

In the right-angled triangle S O T, the angle at O is equal to the angle, n. Therefore,

$$\tan. n = \frac{S\,T}{O\,T} = \sqrt{\frac{2h}{r} + \frac{h^2}{r^2}}$$

As a first approximation, quite sufficient in practice[1], the quantity h^2/r^2 can be neglected. The ratio $h : r$ is actually less than 1 : 1,000 for heights, h, of 6,000 metres. We can, therefore, write

$$d = F\sqrt{\frac{2h}{r}}$$

which gives the value of d when we know the focal length of the camera used; the altitude of the view-point and the mean radius of the earth = 6,371,004 metres.

For each value of F (the focal distance) a curve can be constructed giving the values of d as a function of the value of h, this curve being a parabola, for which the equation is

$$d^2 = \frac{2F^2}{r}\,h$$

But for the construction of a series of curves giving the value of d in all cases it is simpler to set off (fig. 2) the altitude, h, as abscissæ, and the values of d^2 as ordinates—*i.e.*, the squares of the values sought. The curves corresponding with each value of F are then straight lines[2].

In all operations requiring a knowledge of the principal horizon line (correction and reconstitution of perspective) allowance for this shift

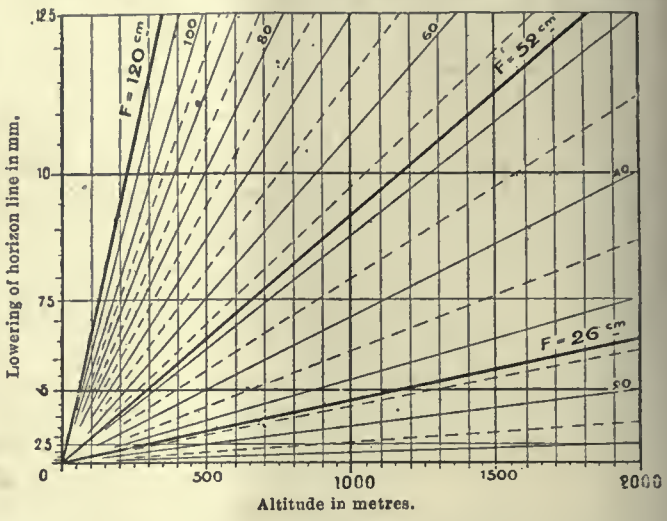


Fig. 2.

should always be made, or, at any rate, when the camera fitted with an indicator of inclination does not show directly on the negative the position of the principal horizon line. L. P. Clerc.

(1) Apparent deviation of the horizon by atmospheric refraction is neglected.

(2) The graphical construction is facilitated by noting that for an altitude of 3,185 metres (1/20000 of the radius of the earth) the values of d^2 are approximately equal to the squares of the focal distance.

If the optical axis is not horizontal at the time of taking the photograph, but is at an angle ω below the horizontal plane, the expression of the corresponding depression $d\,\omega$ becomes rather complex.

$$d\,\omega = \frac{F\ \sqrt{2h}}{\text{Sin.}^2\,\omega\ \sqrt{2h} + \cos.^2\,\omega\ \sqrt{r}} \qquad \frac{F\ (\tan.^2\,\omega + 1)\ \ \sqrt{2h}}{\tan.^2\,\omega\ \sqrt{2h} + \sqrt{r}}$$

ESTIMATION OF THE HEIGHT OF OBJECTS BY THE MEASUREMENT OF THEIR CAST SHADOWS IN AERIAL PHOTOGRAPHY.

The height of a building, fortification or wall, or the depth of an excavation or trench, the difference of heights between the ridge of a mountain and the point to which its shadow extends can be determined in vertically taken photographs[1] of known scale by the dimensions of cast shadows.[2] The degree of approximation is closer according as the scale of the photographs is greater and the shadows long as when the photographs are taken as early or late in the day as the light permits.

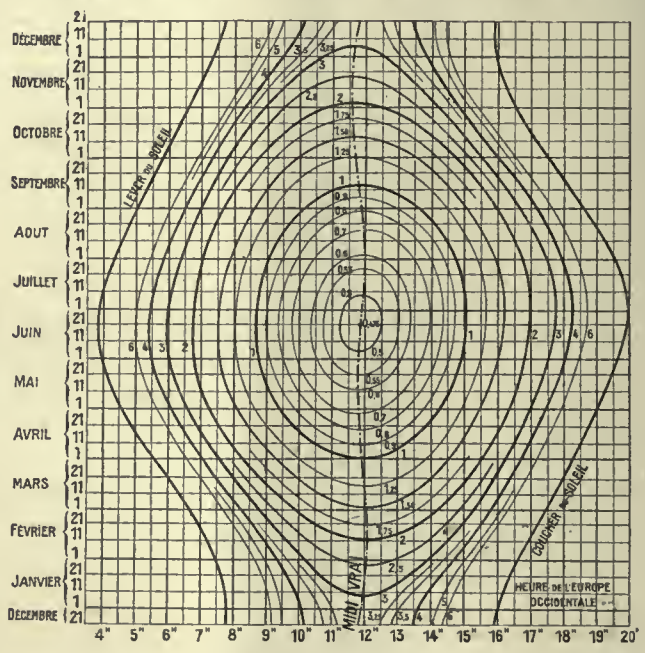
If an object of known height occurs in the field of the photograph it is easy to compare the height of any other object which casts a shadow. Calling h the height of the known object, l the length of its shadow, h' the unknown height of an object casting a shadow of length l', then

$$h' = l'\,\frac{h}{l}$$

But such a comparison method is often impossible. In the case of photographs of inaccessible regions it is necessary to have recourse to the determination of the length of the shadow of an object of known height at the same time of day on the day following or within a day or two of taking the negative. Variation from one day to the next in the length of the shadow at the same time of day is negligible.

It is, however, possible by calculation to dispense with this determination, which, moreover, is impossible when a photograph not of recent date is being examined. Tables of longitude and time indicate for all the days in the year the tim of the passage of the sun to the meridian of Paris (true local noon) and the corresponding value of the declination (angle of the plan of the earth's equator with the straight line joining the centres of the earth and the sun). The variations of declination from one day to another are, moreover, so small that the sun may be considered as occupying a fixed position in the ecliptic from dawn to sunset.

On these data I have calculated a reckoner in the form of the chart (fig. 1)[2] directly utilisable at the region of Paris. The point in the intersection of the horizontal corresponding with the date of the exposure and that of the vertical (approx.) with the time of the exposure is either on one of the curves or comes between two



The figures marked on the various curves indicate, in metres, the length of the shadow cast by a vertical rod of 1 metre height on a horizontal plane at all hours of the day (local French time), and for all periods of the year. In the use of the table the necessary allowance requires to be made for "summer time." To allow for differences of longitude, set back the time noted 4 minutes for each degree of longitude E. For greater accuracy the following co-efficients can be used within the limits of latitude 47 to 51 degrees.

For values of co-efficients up to

	2	3	
add per degree of latitude above 49	5%	6%	6½%
subtract per degree of latitude less than 49	5%	5%	6 %

Fig. 1.

curves. The number marked on a single curve or a number intermediate between those on two adjoining curves indicates in metres

(1) It is customary to describe as "vertical" photographs those made from the air with the lens-axis vertical; the plate horizontal.

(2) The methods of estimation assume, in direct calculation, that a particular object casts its shadow on a horizontal plane (apart from corrections for inclination indicated above), or in the case of comparison observations, that the objects cast their shadows on parallel planes.

the length of the shadow on a horizontal plane of an object one metre in height at the times of day and year in question. Thus, all that has to be done is to divide by this number the length of a cast shadow measured in the photograph in order to obtain, on the scale of the particular photograph, the height of the object casting the shadow.

The curve applies also to any other point of the same latitude (49° N.) by suitable modification of the scale of times (daily),[4] adding four minutes to the time for each degree of longitude west of Paris (or subtracting four minutes for each degree east). It is not applicable to places situated to the north or south of the parallel of Paris, the error amounting to 15 per cent. for a variation of 2° of latitude (parallel of Belfort or Dunkirk) when the shadow is four times the height of the object. It is, therefore, necessary to construct a suitable chart for each region, having calculated the required co-efficient.

At any instant when the zenithal distance of the sun (angle of

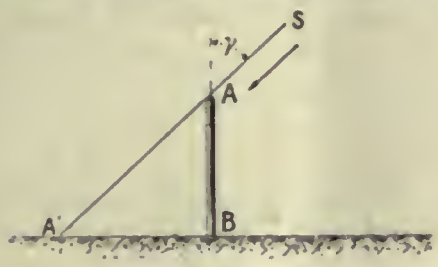


Fig. 2.

the vertical of the place with the line from this place to the centre of the sun) is γ, the length A'B (fig. 2) of the shadow cast by the object AB in the horizontal plane of A' is

$$\overline{A'B} = A\,B \tan.$$

In calculating the angle γ take three co-ordinates (fig. 3), one of which Oz coincides with the line PP' of the poles, the plane xOy being the plane of the equator, and the plane xOz that including Ox and the centre S' of the sun at true noon, the direction OS' making with Ox the angle δ equal to the known declination. Consider then in the plane xOz a point M_0 of the latitude ϕ. For this point the sun is at the meridian (true noon). The zenithal distance γ_0, the angle of the vertical M_0V, and the line M_0S_0 of the sun is equal to M_0OS', and therefore

$$\gamma_0 = \phi - \delta \qquad (1)$$

(4) Reproductions of these charts were officially issued as blue prints to the French army officers in July, 1917.

(5) If the shadow, instead of being cast on a horizontal plane falls on an inclined plane, the angle which the shadow makes with the horizontal being called σ the length L of the shadow and its projection L' on a horizontal plane are:—

$$L = \frac{h \sin.\gamma}{\cos.(\gamma + \sigma)} \qquad L' = \frac{h}{\cos.\gamma + \tan.\sigma}$$

σ is reckoned positively or negatively according as the extremity of the shadow is lower or higher than the foot of the object.

(6) During the period of the advance of the clock (Summer Time) the time is reckoned one hour less in order to compensate for the modification.

At every instant other than the true noon, the point of the earth in question has come into M such that the angle M_0Om of the corresponding meridian is equal to 15 t, t being the interval of time in hours between the true noon and the moment in question (the rotation of the earth is 360° per 24 hours = 15° per hour). The corresponding zenithal distance is the angle VMS = VOS'. From M let fall a perpendicular MM' on OS'. The co-ordinates of M.

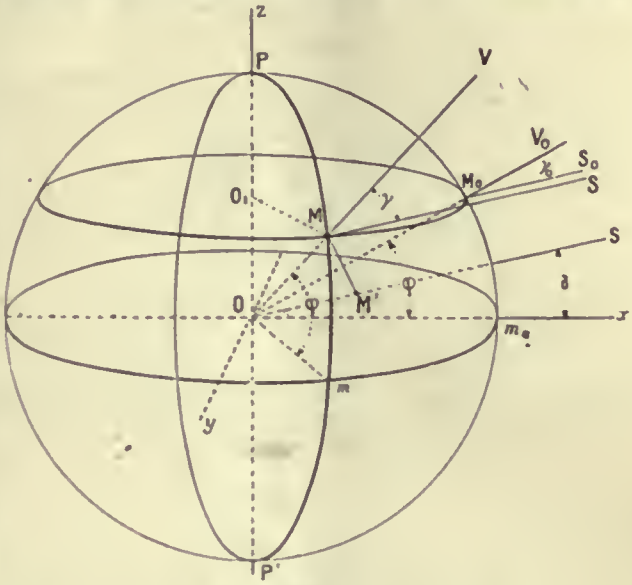


Fig. 3.

and M' are respectively, taking the earth's radius as unit of length :—

M	M'
$x = \overline{O_1 M} \cos. 15\,t = \cos.\phi \cos. 15\,t$	$x = \overline{O M'} \cos.\delta = \cos.\gamma \cos.\delta$
$y = \overline{O_1 M} \sin. 15\,t = \cos.\phi \sin. 15\,t$	$y = \overline{O}$
$z = \overline{O O_1} = \sin.\phi$	$z = \overline{O M'} \sin.\delta = \cos.\gamma \sin.\delta$

The value of the angle γ is obtained by remembering that MM' is perpendicular to SS' and that therefore the sum of the projections on OS' of the projections of MM' on the three axes of the co-ordinates is zero.

$$(\cos.\gamma \cos.\delta - \cos.\phi \cos. 15\,t) \cos.\delta + (\cos.\gamma \sin.\delta - \sin.\phi) \sin.\delta = \underline{O}$$

or, after simplifying,

$$\cos.\gamma = \cos.\phi \cos. 15\,t \cos.\delta + \sin.\phi \sin.\delta \qquad [2]$$

For the determination, point after point, of each curve corresponding with a suitably chosen value of tan γ, γ and ϕ being fixed, the method has been to calculate for periods of about 10 days, expressing t in functions of δ. The times t thus determined were then set out, starting from true noon, for the two dates of the year having the same value of δ. Each calculation thus yields four points. The intersection of each curve with the curve of true noon were supplied by the equation (1).

L. P. CLERC.

ON THE LIMIT OF ADMISSIBLE ANGLING IN VERTICAL OR HORIZONTAL PHOTOGRAPHY.

In fig. 1 consider a photograph made from the viewpoint S with a lens of focal length F the axis S. P. of which makes an angle w with the vertical S V and compare this image with that which would have been obtained from the same point with the same lens directed vertically downwards.

Let T. and T' be the planes of the respective images, I J their intersection (axis of collineation of the two images), and P and P' their principal points. It will be noticed that along their intersection I J the two images are identical and that the distances I P, I P' of the principal points from this intersection are equal to each other, and to F tan. $\frac{w}{2}$.

In the plane, containing the vertical from the point S, and perpendicular to I J, draw a horizontal meeting the plane T in H. This point H is thus the vanishing point of the images of the horizontals parallel to P' I. It can be easily (1) shown that

$$I\,H = H\,S \frac{F}{\sin.\,w}.$$

A certain point of the region photographed forms its image in A in the plane T and in A' in the plane T'. The plane which contains S H and this point cuts the plane T along H A and the plane T' along a A'. We will now determine in the plane T the co-ordinates of the point A relatively to the axes I J and I P as a function of the co-ordinates of the point A' in the plane T' relatively to the axes I J and I P'.

From A draw Aa parallel to I J. From the similar triangles HAa and HaI

$$\frac{Aa}{aI} = \frac{Ha}{HI} \quad \text{or} \quad \frac{x}{x^1} = \frac{\dfrac{F}{\sin.w} + y}{\dfrac{F}{\sin.w}}$$

whence we have

$$\frac{x - x^1}{x} = \frac{y}{\dfrac{F}{\sin.w} + y} \qquad x - x^1 = \frac{xy}{\dfrac{F}{\sin.w} + y} \quad [1]$$

From the similar triangles H A S and a A A¹ on the one hand and H Aa and HaI on the other, we have—

$$\frac{aA^1}{HS} = \frac{Aa}{AH} \qquad \frac{Aa}{AH} = \frac{Ia}{Ha}$$

whence

$$\frac{aA^1}{HS} = \frac{Ia}{Ha} \quad \text{or} \quad \frac{y^1}{\dfrac{F}{\sin.w}} = \frac{y}{\dfrac{F}{\sin.w} + y}$$

whence

$$\frac{y - y^1}{y} = \frac{y}{\dfrac{F}{\sin.w} + y} \qquad y - y^1 = \frac{y^2}{\dfrac{F}{\sin.w} + y} \quad [2]$$

In order that a point of the image T shall coincide with the corresponding point in the image T¹, it is necessary that after bringing T

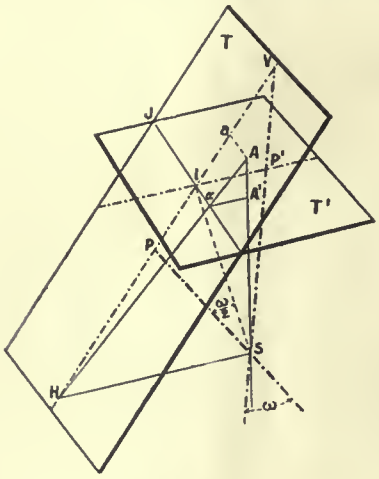


Fig. 1.

on to T¹ along the common axis I J, the distance of the two corresponding points should be less than the admissible error of definition ε, condition which may be written :—

$$(x - x^1)^2 + (y - y^1)^2 < \epsilon^2$$

or, substituting for these differences their values found in (1) and (2)

$$x^2 y^2 + y^4 < \epsilon^2 \left(\frac{F}{\sin.\omega} + y\right)^2$$

The area of the oblique photograph susceptible of being united with the vertical photograph taken from the same view-point is therefore limited by the curve :—

$$x^2 = \frac{\epsilon^2\left(\dfrac{F}{\sin.w} + y\right)^2 - y^4}{y^2}$$

the form of which recalls that of a *Nicomedes conchoïd* of which the axis IJ is the directrix.

By way of example, a series of these limited curves has been traced (fig. 2.) on centimetre squared paper for different values of the angle w which in the case of photographs made with a 26cm. lens, allowing an error of definition of 0.02cm. (1/5mm.). These curves are brought into correspondence with the horizontal line of each negative drawn by the principal point. Plainly the same considerations would apply to panoramic photographs made with the optical axis of the lens inclined at an angle below the horizon. But most usually the panoramic photograph is employed only with the measurement of horizontal angles, all the important points of the image being first

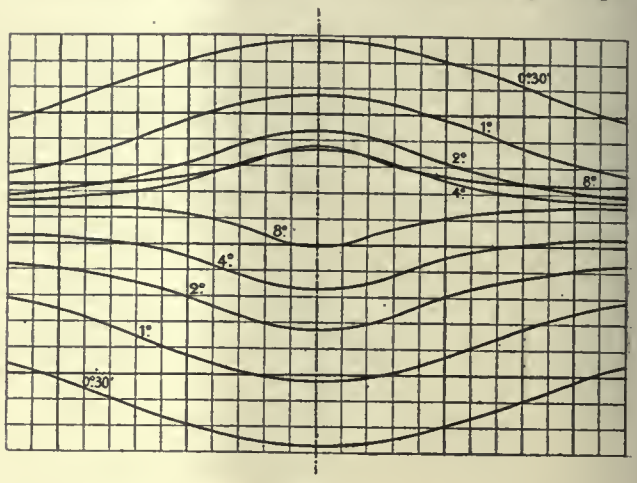


Fig. 2.

projected on a horizontal line of the plate. In this case the variations of the ordinates are no longer of effect on the exactness of the measurements and it is sufficient to limit the regions of the plate to the interspace of which the differences (x—x¹) are less than the admissible error of definition. The limiting curves will be defined by the condition

$$x - x^1 = \pm \epsilon$$

or, substituting for this difference its value previously calculated (1),

$$x\,y = \pm \epsilon \left(\frac{F}{\sin.\omega} + y\right)$$

an equation which (after removal from the axis of the y's of amplitude equal to ε and therefore negligible) becomes :—

$$x\,y = \pm \frac{\epsilon F}{\sin.\omega}$$

that is, corresponding with two equilateral conjugate hyperbolas the asymptotes of which are the common axis IJ, and a perpendicular to this axis from the principal point.

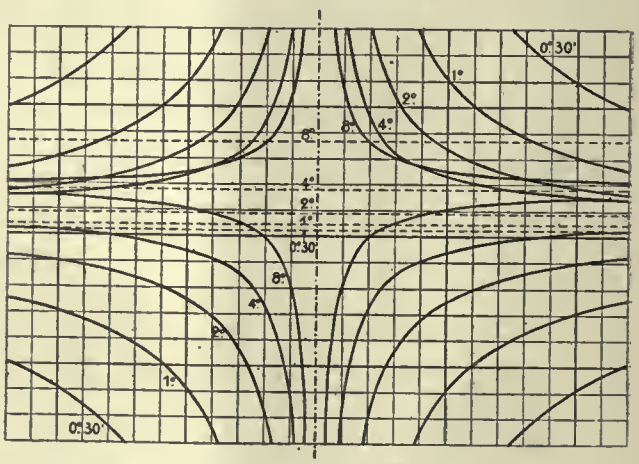


Fig. 3.

Fig. 3 is a series of such limiting hyperbolas traced for different values of the angle w in the case of photographs made with a 26 cm. lens, and with an error of definition of 1-5 mm. These curves have been brought in each case to the horizontal line containing the principal point. At the same time, except for the horizontal

[1] It is seen that I H = I P + P H. But I P = F tan $\frac{w}{2}$, and P H = Fcot.w. By addition and expression of cot. w as a function of the trigonometrical lines of the angle $w^1 = \frac{w}{2}$ we have—

$$I\,H = F\left(\tan.w^1 + \frac{1 - \tan.^2 w^1}{2\tan.w^1}\right) = \frac{F}{2\sin.w^1\cos.w^1} = \frac{F}{\sin.w}$$

and—

$$S\,H = \frac{F}{\cos.H\,S\,P} = \frac{F}{\sin.w}$$

error of 0°-30' the position corresponding with the intersection of the plane of the image and the horizontal plane containing the viewpoint S has been shown.

It will be seen that in the case of a vertical or horizontal error of half a degree the useful surface (12 x 17) of a 13 by 18 plate is comprised wholly within the limiting curves which correspond with an error of definition of 0.02 cm. (2 metres at 2,600 metres). The angle indicator suitable for such a camera for photogrammetric purposes should therefore read to within nearly half a degree in order to obtain a plan of the required accuracy.

L. P. Clerc.

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Applications, May 5 to 17:—

Print Dryer.—No. 11,651. Means for drying photographic prints. S. H. Morse.

Cinematography.—No. 11,395. Cinematograph apparatus. O. D. Binger and J. Stoop.

Projection Apparatus.—No. 11,549. Apparatus for projecting images upon a screen. R. G. Cave and R. O. Harmes.

Cinematography.—No. 11,431. Shutters for cinematograph cameras and projectors. F. van Neck.

Cinematography.—No. 11,430. Focussing devices for cinematograph cameras.

Projection Screens.—No. 11,576. Screens for cinematographs, lanterns, etc. H. Proud.

Cinematography.—No. 11,791. Screen for cinematograph projection. A. Villers.

Tripods.—No. 12,439. Photographic tripod stands. M. Belassie.

View Finders.—No. 12,460. View finders for cameras, etc. L. B. Jones.

Lens Holders.—No. 11,861. Means for securing lenses, etc., in holders. A. B. Forster.

Projection Screens.—No. 12,030. Screens for photographic or cinematographic projection. J. L. Pech.

Cinematography.—No. 12,126. Living pictures. R. M. Alexander.

Cinematography.—No. 12,262. Cameras, cinematograph machines. J. M. Houben.

Cinematography.—No. 12,327. Cinematograph apparatus. A. Maurice.

Cinematography.—No. 11,930. Cinematograph machines. W. M. Worman.

COMPLETE SPECIFICATIONS ACCEPTED.

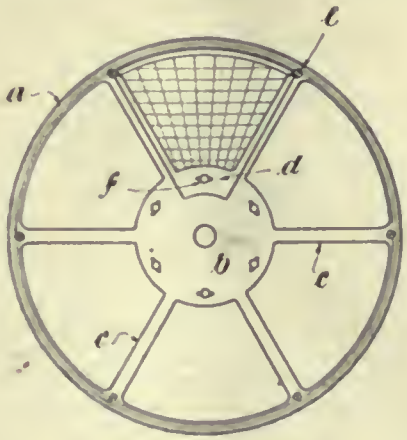
These specifications are obtainable, price 6d. each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

Cinematograph Shutters.—No. 121,751 (January 7, 1918). According to the invention a shutter for a cinematograph is provided wherein the masking and anti-flicker segment comprises strips of different coloured translucent material. The strips are preferably mounted in a frame, which is adapted in turn to be mounted in a shutter frame on which coloured segments may also be mounted for colour projection, and the colour segments may be arranged to slide behind the masking segments, springs and catches being provided to operate and hold the colour segments, and in such connection the springs may serve automatically to move the segments when a fixed stop is placed in the path of the catches.

As shown in the drawing, *a* is the rim of the shutter frame, *b* the central part, and *c*, *c* the connecting arms, the whole being formed in one piece, and preferably in thin sheet metal. The masking segment *d* consists of a light metal frame and a series of strips of translucent material, each side of the frame being U-shape in cross section, and the ends of the strips being clamped by the frame.

Certain of the strips are arranged transversely to the other strips, and whilst the strips arranged in one direction are coloured



red, the others are coloured green, so that at all parts of the segment the light has to pass through the two colours.

For fixing the segments to the shutter the outer corners are adapted to fit against studs *e*, whilst the inner part is slotted and caused to engage a T-headed clamping screw *f*. When used, the anti-flicker segments are constructed and fixed in a similar manner. Herbert Shorrocks, 199, Brunswick Street, Chorlton-cum-Medlock, Manchester.

Aircraft Cameras.—No. 124,225 (April 20, 1917). The invention comprises improvements in the general construction of aircraft cameras, and provides interchangeable locking means which enables the camera to be operated either manually or by means of

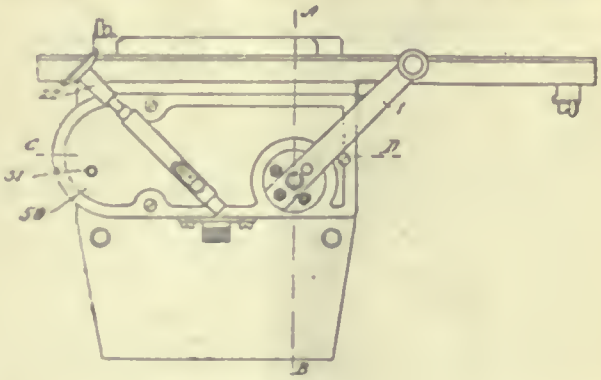


Fig. 1.

an air screw, while preventing the misuse of the camera during such operation, and thus ensuring the correct sequence of operations in changing the plates and resetting the shutter.

The mechanism for changing the plates and setting the shutter comprises a shaft 2, having mounted thereon a handle 1, rigidly connected by set screws 35 with a segmental toothed member 3 engaging with the pinion 4 mounted upon a shaft 36 carrying a pair of larger gear wheels 5, which in turn respectively engage with the racks 6 on the underside of a plate carrier 7.

The handle 1 and the segmental toothed member 3 can be locked by means of a removable locking pin 28 with a reciprocating lever 29 freely mounted on the same shaft 2, and thus recipro-

cate through the lever 29 and a connecting link 30 by a mutilated wheel 17, adapted to be rotated by an airscrew or like means.

If it is desired to reciprocate the handle 1 manually, the pin 28 is removed, thus disconnecting the mutilated wheel 17 from the segmental member 3. The pin 28 can be used to lock the wheel 17 to the casing 50 by passing the pin through the hole 51 in the casing and the hole 52 in the wheel 17, which holes are in register when the wheel is in the position shown in Fig. 3 and disconnected from the airscrew until the exposure trigger is operated.

The plate carrier 7 is arranged to slide in a rectangular framework 8, forming, for convenience, part of the main framework

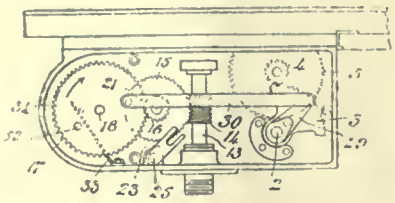


Fig. 2.

of a camera body A blind shutter 9 is employed, the operating means being provided for through intermediate gearing between the operating handle 1 and a shutter roller 11. In addition to the roller blind shutter, the camera is provided with a capping flap 12, which is operated during the process of making the exposure.

The mechanism for carrying out the automatic operation of the camera comprises an air screw (not shown) or propeller conveniently driving the changing mechanism through a flexible shaft, allowing of it being placed in any suitable position by the airman.

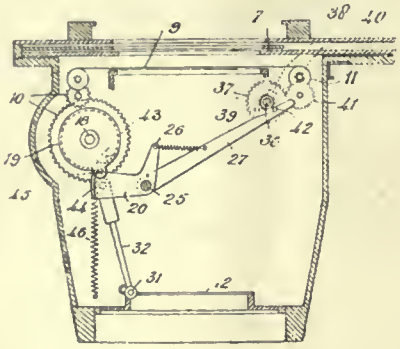


Fig. 3.

The flexible shaft is coupled to the shaft 13, and a worm 14 in engagement with the worm wheel 15 integral with a pinion 16 engaging with a larger mutilated toothed wheel 17. The larger toothed wheel 17 makes one complete revolution before reaching that portion 21 of the wheel from which the teeth have been removed. The air screw is then free to rotate without actuating the shutter re-setting and plate-changing mechanism until the operator releases the shutter by pressing down the trigger 22. When the mutilated wheel is in this position the leaf spring 33 bears upon a pin 34 mounted thereon, and will move the mutilated wheel 17 to a position which will allow of the pinion wheel 16 engaging with the teeth of the mutilated wheel as soon as the shutter has been operated, thus allowing of the operations of resetting the shutter and changing the plate being carried out.

The mutilated toothed wheel 17 is mounted upon and adapted to rotate a shaft 18 carrying a flanged escapement wheel 19 provided with a slot 43 and stop pin 45. This escapement wheel is adapted to prevent the movement of a pallet 20 except when the escapement wheel reaches a position in which a heel on the pallet registers with the slot 43 in the flange of the wheel 19, and simultaneously the opening 21 in the mutilated wheel 17 is in the position opposite the pinion 16, and consequently out of gear until the exposure trigger is operated. In this position the lever or pallet 20 is allowed free movement, and the exposure or shutter operating trigger 22 can be pushed down, thus actuating the lever 23 by means of the pin 24 shown in dotted lines in Fig. 5 and rotating the lever shaft 25, upon which is rigidly mounted the pallet 20, and consequently turning the pallet to a position in which the heel 44 of the pallet has passed the stop pin 45 and entered the escapement wheel through the slot 43.

When the heel 44 has passed the pin 45, the wheel 19 moves forward under the influence of the leaf spring 33 pressing the pin 34 of the mutilated wheel 17, which is mounted on the same shaft 18 as the escapement wheel 19. The movement of the pallet causes a pin 26 to engage the lever 27 and to release the gearing operating the roller blind 9.

As soon as the wheel 19 has moved forward under the influence

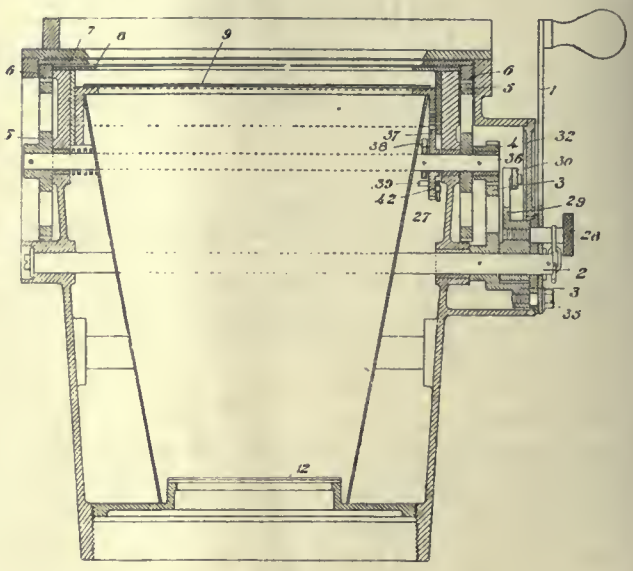


Fig. 4.

of the spring 33, the pallet heel 44 is moved back behind the pin 45 to its first position under the influence of the spring 46, and the resetting of the shutter and change of the plate go on automatically. The rotation of the mutilated wheel 17 by the air-

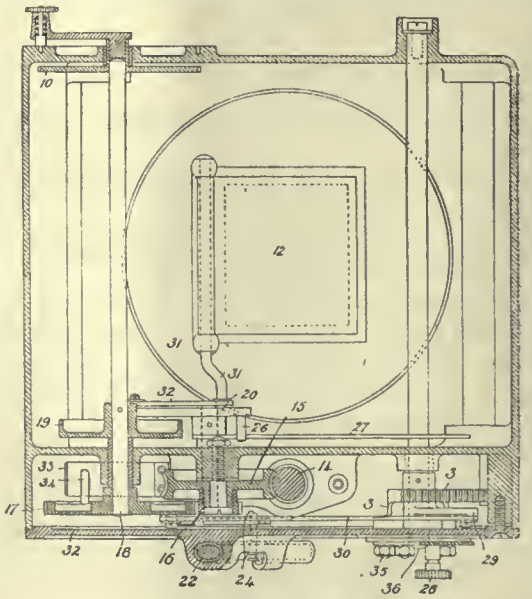


Fig. 5.

screw, and with it the escapement wheel 19, turns the escapement wheel again to the position in which another exposure can be made by the operation of the trigger.

The blind shutter mechanism is wound up from the plate-changing rack wheel shaft 36 through a gear wheel 37 mounted

on the shaft, actuated by a hammer 38 fast on the shaft and a pin 39 mounted on the gear wheel 37, which is loose on the shaft, in engagement with a pinion 40 in one with the shaft carrying the blind roller through the intermediate wheel 41, thus allowing the shutter to be reset. On the other side of the gear wheel 37 a pin 42 is arranged which engages with the pawl lever 27 adapted to lock the mechanism until the operator moves the exposure trigger 22, the lever 27 being operated by a pin 26 at one extremity of the pallet lever 20 as above described.

The capping flap 12 is operated from the pallet 20 through a bell crank lever 31 and connecting rod 32, one end of the connecting rod being connected to the bell crank lever and the other end to the pallet 20.

When the camera is operated mechanically by the handle 1 the locking pin 28 is changed over to lock the mutilated wheel 17 to the casing cover 50.

The removal of the locking pin 28 which locks the handle 1 and the lever 29 mounted on the same shaft 2 to the segment 3 allows of the free movement of the segment under the direct control of the handle 1 through the connecting pin 35, the operation of the plate-changing mechanism being carried out after each exposure by the handle as before described through the medium of the toothed segment and the gearing operating on the plate carrier racks. Frederick Charles Victor Laws, 53, Aldbourne Road, Uxbridge Road, London.

Trade Names and Marks.

MARKS PLACED ON THE REGISTER.

The following marks have been placed on the register:—

VODETTE.—No. 387,774. Photographs and photographic papers. Albert Drummond Shiels, Thornhill House, Wishaw, Scotland, photographic artist.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

SATURDAY, MAY 31.

Chelsea Photographic Society.—Outing to Mitcham.
Liverpool Amateur Photographic Association.—Outing to Beeston Castle neighbourhood.

MONDAY, JUNE 2.

South London Photographic Society.—"Colouring Bromides." A. Vernon Godbold.

TUESDAY, JUNE 3.

Royal Photographic Society.—"Aerial Cameras." Major Laws.
Hackney Photographic Society.—"Chat on Pictorial Photography." S. Bridgen.
Manchester Amateur Photographic Society.—"Composition for Beginners." T. M. Shaw.

WEDNESDAY, JUNE 4.

Croydon Camera Club.—"The Importance of Photography in the War." A. Dordan-Pyke.
Edinburgh Photographic Society.—Fifty-ninth Annual Meeting.

THURSDAY, JUNE 5.

Hampshire House Photographic Society.—Annual General Meetings.

FRIDAY, JUNE 6.

Liverpool Amateur Photographic Association.—Outing to Llanwchyllyn.

ROYAL PHOTOGRAPHIC SOCIETY.

MEETING held Tuesday, May 27, Mr. W. B. Ferguson, K.C., in the chair.

Dr. G. H. Rodman delivered a long and most interesting lecture on "Spiders, their Structure and Habits," illustrated extremely fully by natural size photographs of the many known types of spider and by photo-micrographs of their organisms. The very hearty thanks of the audience were accorded to the lecturer.

CROYDON CAMERA CLUB.

AFTER an evening on the spookiest spooks that ever sputtered into being, followed by a washout in the "air and atmosphere art line," last week's fixture came as a welcome relief, the Rev. F. C. Lambert, M.A., F.R.P.S., showing "A Few Simple Experiments." So far as can be remembered, long years have passed since his last visit, and he rather pathetically alluded to himself as being an old man, the only departure from the truth uttered by him during the evening.

He began with a string of apologies, with a final apology thrown in for so many apologies. In photographic circles, he said, it was generally known that what the club did not know was not worth knowing, which included many things known by members not worth knowing.

Out of the slenderest materials he then lectured and demonstrated on various optical, psychological, biological, and other "ogical" matters in most logical fashion, and in doing so struck a novel keynote, which may be described as the antithesis of text-book methods of imparting knowledge. Really instructive were the simple experiments shown, many new to those interested in science, and even the least scientific followed them with obvious attention and interest. Knowledge, he said, only comes from personally-conducted experiments, and if some may regard the observation as rather too sweeping, all will agree that the educative value of careful experiments can hardly be over-estimated.

With the alert mentality of youth, the "Croydon manner" never found him at a loss in suitably responding. The blackboard was much used as a recreation ground, and he remarked, if he appeared at all didactic, an early career as a schoolmaster must afford the excuse for restoring any atmosphere of schooldays. "Anyway, you can't spank us," gleefully interrupted the "office boy." "Unfortunately, no," replied the lecturer. Further on, when referring to the primitive ideas on geometry possessed by savages, a member rose and pointedly asked whether allusion was being made to the members of the club. "Not exclusively so," gently said Mr. Lambert, after which he was left in peace.

To give an idea of the way in which subjects were approached, one example relating to "parallax" may be mentioned. Of course, quite an imposing diagram might have been constructed, but he preferred to start with the case of a short and a tall man taking a reading of a barometrical mercury column against a scale set behind the tube, and then, by a simple diagram, showed that the readings might differ. Quite a neat way of conveying the principle involved, and incidentally of removing the impression of one member that it was a contagious disease.

Photographic points touched upon were few, but in the discussion Mr. Sellors, referring to a consideration of the percentage of light reflected by mirrors at various angles to the incident light, said in reflex cameras the usual angle to set the mirror was 45 deg. In a home-made reflex he had employed an angle of 55 deg., and in consequence secured a far brighter image on the focussing screen, and was only sorry he had not carried the idea further. Disregarding a suggestion of a genius that 360 deg. should be ideal, he added that he never employed a surface-silvered mirror, and had never been troubled by double reflections. The lecturer said that had also been his experience. For a delightful exposition on natural magic a most hearty vote of thanks was accorded, tendered to one who has been "the guide, philosopher, and friend of many a young photographer," as the president nicely phrased it.

FORTHCOMING EXHIBITIONS.

September 13 to October 11.—London Salon of Photography. Entries close September 2. Hon. sec., 5a, Pall Mall East, London, 1

TORONTO PHOTOGRAPHIC EXHIBITION.—In reference to the exhibition being arranged by the Toronto Camera Club as part of the Canadian National Exhibition we may supplement our note of a week ago by saying that we have a few entry forms which we shall be glad to send to intending exhibitors, and so save them the delay of communication with Canada. The last day for the receipt of exhibits at Toronto is July 19.

Commercial & Legal Intelligence.

NEW COMPANIES.

COMMERCIAL ART STUDIOS, LTD.—This private company was registered on May 13 with a capital of £1,000 in £1 shares. Objects: Photographers, etc. The subscribers (each with one share) are:—W. Hutchinson, 55, Pont Street, S.W., barrister-at-law; R. H. King, Strathspey Regent's Park Road, Finchley, N.3, solicitor. Directors: W. Hutchinson and R. H. King. Registered office, 16, Ludgate Hill, E.C.

WYNNE-HARLEY, LTD.—This private company was registered on May 16 with a capital of £1,000 in £1 shares (300 pref.). Objects: Dealers in photographic and scientific apparatus and materials, publishers, lithographers, etc. The subscribers (each with one share) are:—J. Wynne-Harley, 53-4, Chancery Lane, W.C., commercial illustrator; Jane M. Winterbourne, 53-4, Chancery Lane, W.C., artist; R. Clayton, 53-4, Chancery Lane, W.C., commercial photographer. Directors: J. Wynne-Harley, Jane M. Winterbourne, and R. Clayton.

ST. STEPHEN'S PHOTO-ENGRAVING CO., LTD.—This private company was registered on May 17 with a capital of £5,000 in £1 shares. Objects: Photographic process block makers, designers, engravers, photographers, printers, etc. The subscribers (each with one share) are: H. W. Hawkins, 163, Redland Road, Bristol, newspaper manager; W. J. Robinson, 2, Nevil Road, Bishopston, Bristol, photographer; F. P. Leach, 99, Bishop Road, Bishopston, Bristol, incorporated accountant. First directors: H. W. Hawkins, W. J. Robinson, and F. P. Leach.

UNIVERSAL WOODWORKING CO., LTD.—This private company was registered on May 14 with a capital of £5,000 in £1 shares. Objects: To acquire the business of manufacturers of and dealers in wood and metal furniture, instruments, rules and small goods, carried on by F. H. Shaw at Newhall Hill, Birmingham, under a similar style; also to carry on the business of manufacturers of photographic apparatus and materials, drawing models, compasses, kindergarten goods, calisthenic apparatus, wood dumb-bells, wands, bar-bells, musical skipping-ropes, easels, camp stools, test tube-holders, laboratory sundries, etc. The subscribers (each with 1,000 shares) are:—A. Westwood, 142, Varna Road, Edgbaston, Birmingham, works manager; A. Lawson, 28, Beechwood Road, Bent Lanes, Birmingham, solicitor's clerk. Permanent directors: A. Westwood, and A. Lawson.

News and Notes.

MR. ARCHIE HANDFORD, of 1, Prince's Avenue, Muswell Hill, has on his demobilisation disposed of his business and accepted a position as director with Gordon Chase, Ltd., Bromley and Beckenham.

MESSRS. KENTMERE, LTD., have arranged for a stock of their various papers and cards to be held for them by Mr. Arthur J. C. Lewis, Photographic Works, New Barnet, Herts. Any orders sent to Mr. Lewis will be promptly attended to, and goods sent along same day if order is received reasonably early and is for normal sizes and quantities. Special sizes can always be supplied in the course of a post or two direct from the mills, should they not happen to be kept in stock at the London depôt.

GLASGOW PROFESSIONAL PHOTOGRAPHERS' GOLF CLUB.—After a period of suspense of three years this club has again resumed its activities. A meeting was recently held on the Douglas Park Course, Dearsden. During the present month the club is running the first round of the Mainds Shield. Its next meeting will be held on June 6. The club will welcome new members, who have no occasion to be expert players. Enquiries should be addressed to the secretary, Mr. John M. Robertson, 3, Scot Street, Sauchiehall Street, Glasgow.

THEATRICAL PHOTOGRAPHY.—Many important points (writes a correspondent) have been gained by actors and actresses engaged under West End managements as a result of the recent "standard contract" agreed upon between actors and managers. The one item of particular photographic interest is that which decrees that "photographic calls shall be treated as rehearsals"; and as another item states that any artist receiving less than £10 per week shall be paid 10s. for each rehearsal, it means that ballet girls and many others, when attending a studio officially, will be paid by the management.

PICTORIAL PHOTOGRAPHY IN AMERICA.—An annual publication to be issued with this title is announced as making its first appearance about November of the present year. The promoters, in acknowledging the representation of British pictorial work in "Photograms of the Year," say that it is their intention to make the volume in no respect inferior to the British repository of current photographic art. The publication will be in the charge of an editorial board consisting of Messrs. Clarence H. White, W. H. Porterfield, John Paul Edwards and Dwight A. Davis. Prints to be submitted for inclusion in the volume should be sent to the Board, 122, East 17th Street, New York, to arrive not later than July 1. The volume is to be published by Messrs. Tennant and Ward, 103, Park Avenue, New York, at the price of 2 dols. 50.

PHOTOGRAPHERS' ASSOCIATION OF AMERICA.—This association of professional photographers is again holding its summer conference (the first in three years) at Cedar Point, on Lake Erie, near Cleveland. The meeting is of more than ordinary interest, since it signalises the fiftieth anniversary of the first meeting of professional photographers in the United States. A large programme of demonstrations and lectures has been arranged; there will be an exhibition of portraiture by leading professional photographers and a great representation of the manufacturers. The conference will last from July 28 to August 2, and we are glad to pass on from the general secretary, Mr. J. C. Abel, a cordial invitation to any photographer to take part in the conference. Any communications for the general secretary should be addressed to him at 421, Caxton Building, Cleveland, Ohio.

Correspondence.

**** Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

**** We do not undertake responsibility for the opinions expressed by our correspondents.*

MASKING IN ENLARGING.

To the Editors.

Gentlemen,—I would like to endorse the remarks of "Practicus" in your issue of the 9th inst. re enlarging with and without masks on the negatives. The two methods put forward by your contributor "Thermit" some weeks ago are also noteworthy; the idea of sizing up (on a white paper, I take it) on a black easel is novel, and certainly has its merits.—Yours faithfully,

H. T.

REVERSAL IN TANK DEVELOPMENT.

To the Editors.

Gentlemen,—Referring to your note re reversal in the current issue of the "B.J.," I am sending you an old negative from my accumulation of curiosities, which may, perhaps, throw some light on this matter. The example sent, as you will observe, shows a negative at one end, which merges into a positive at the other. The cause of this reversal was light-leakage in the dark slide.

Another form of quasi reversal is occasionally met where the shadow detail of the negative portion appears, as it were, bleached, and makes a partial positive, unmistakably different from that caused by the action of light. This occurs only when the developer is of the metol-hydroquinone type and lacking in sulphite, the presence of quinone in the developer presumably being the inciting cause in such instances.—Yours very truly,

E. A. MAITLAND.

THE SYSTEMATIC TONING OF P.O.P.

To the Editors.

Gentlemen,—I am pleased to learn from your pages (p. 283, of last week's issue) that Rajar, Ltd., are making an effort to revive the practice of toning P.O.P. systematically, but, if I mistake not, it was Mr. Wilson, of the Paget Company, who originated the system, not the Kodak Co. According to my reference book the plan—with table—was first published in a booklet issued by the Watford firm in the year 1894.

The original table was not so simple as that given by Rajar, Ltd., and it was because of its complicated nature that the average photographer did not take so kindly to it as he should have done. I may perhaps recall the fact that the (1894) toning bath was as follows: Water, 8 ozs.; ammonium sulphocyanide 12 grs.; gold chloride 1 gr. Sixteen minims of this bath were required to tone a square inch of print, or, in other words, 1 oz. of the toning bath was required for a full half-plate print.

The simplicity of the Rajar table has much to recommend it, and it is one that should—and probably will—find its way into works of reference.

The table, like the Paget table, is excellent for the P.O.P. made by the firm advocating it, but I am not so sure that other makes of paper work at their best with either of them, because of the varying natures of P.O.P.—Yours faithfully, L. T. W.

ASSISTANTS' WAGES.

To the Editors.

Gentlemen,—Could you spare the space in the "Correspondence" column of the "B.J." to publish the following remarks on the wages offered to assistants by the professional photographers at the present time?

Looking through the "Situations Vacant" column one cannot fail to notice one or two of such advertisements advertising for operator and retoucher, bromide printer and enlarger, etc., requiring a thoroughly competent, capable man for the inadequat sum of £2 per week. How does an employer expect any man to exist on that, especially in London, where he is compelled to pay at least £1 10s. for decent lodgings, apart from tube and bus fares, to dress respectably for the position of operator, considering that at the present time £2 is only equivalent to 16s. or 17s. in 1913? Thousands of men like myself enlisted early in the war, when the public were patriotic. Employers promised the men their situations would be kept for them. Now the latter have come back to find girls and the men who have "swung the lead" occupying their berth at a mere existing salary, and taken on temporarily; the employers now refuse to re-engage their pre-war assistants, as they are getting the work done by cheap labour.

Many clever and competent men have re-engaged in various branches of the Army and Air Force, for the simple reason that, though not liking a military life, they are better paid, besides being provided with food and clothing, preferring to be so employed rather than add one more to the long queues often seen outside the Labour Exchanges.

In cases where girls are compelled to earn their own living, when doing a man's work they should receive the same rate of pay, not, as often is the case, 10s. or 15s. a week less. Unfortunately, there are plenty of "war products" on the labour market, amateurs of pre-war days with other trades on their hands, who were called up for service and managed to get into photographic sections of the R.A.F., and now consider photography an easy way of making a living. Their knowledge is usually limited to the plain, straightforward work learnt during their Army career; yet they are now preventing numerous competent men from obtaining a respectable post.

I fully agree with a high-class photographic artist who some time ago, when advertising, inserted: "No war product need apply," and was criticised in "John Bull." Evidently Mr. Bottomley does not quite understand what harm the war-product has done to the assistant who has served his time to the trade only to find it usurped by such. Hoping this may help some to realise what many assistants are feeling sore about.—I am, yours faithfully,

An Assistant.

Answers to Correspondents.

SPECIAL NOTICE.

In consequence of general reduced supplies of paper, as the result of prohibition of the importation of much wood pulp and grass, a smaller space will be available until further notice for replies to correspondents.

Moreover, we will answer by post if stamped and addressed envelope is enclosed for reply: 5-cent. International Coupon, from readers abroad.

The full questions and answers will be printed only in the case of inquiries of general interest.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

S. N.—If the deposit has a crystalline appearance, it probably consists of hypo, which is hardly likely to be present in such a quantity. If fluffy, it is mildew, and for this we fear you can do little, except to wash it off.

F. M.—We expect the marks are metres, which can be reckoned sufficiently near for practical purposes as yards. If you convert into feet you will see that the scale approximately corresponds with that on British cameras.

P. L.—An iodine bleach for sepia toning consists of a solution of, say, ½ oz. iodine and 1½ ozs. potassium iodide in 20 ozs. of water. It is a very expensive bleach, and has no advantages over the mixture of ferricyanide and bromide. We do not know of any sulphite sepia toning bath

E. R.—If you move a business to a new quarter, we are practically certain that such would be regarded as the establishment of a new retail business, and you would require to apply for a licence to the office which deals with the district to which the business is being transferred We published particulars of these offices in the "British Journal" of May 9.

W. M.—It is possible that the metallic spots are caused by impurities in the alum. You may have bought it from the same dealer all the time, but he may not have been buying it from the same firm. The most common cause of these spots is through iron rust in the wash-water, in which case they can be prevented by tying a flannel filter over the tap.

F. C.—Certainly, you are eligible to apply for a licence to start a new retail business. You do not say where it is proposed to establish the business, but you will be able to tell from the enclosed cutting the office to which to apply. You must apply to the office dealing with the district where the business is to be established, which may not be the same district as that where you are now living.

L. A. N.—To produce a mezzotint a copper plate is first finely grained all over by mechanical means. If an impression were taken it would be an even black all over. The artist produces high-lights and half-tones by scraping and burnishing the copper where necessary. The surface usually receives a final coating of steel to save wear. Colour mezzotints are produced by inking the one plate locally; this requires great skill.

M. F.—The particulars of the lens are very scanty, but as it is described as a doublet, it is probably quite an old Ross doublet of apertore probably *f*/8. These are very excellent lenses in their way, and while not of the covering power of an anastigmat, give excellent definition over a somewhat narrower angle. For a whole-plate we should say the focus should be 10 or 12 ins. This, no doubt, you can easily measure.

M. N.—No need to apply for a licence. If the business is carried on in any name other than your own it is necessary to register it and to state your real name on stationery. The only means of avoiding this necessity is to convert the business into a private

limited company, but even in this case, if you are a director of the company, a further Act directs that your name shall appear upon the stationery.

R. H.—The size you name is not a standard Continental size, and certainly not a British. Possibly the dark-slides take plates of a different size from the focussing screen. We are sorry we are not able to identify the maker of the camera from the mark you mention, which very likely is only the registered mark of some French dealer. Perhaps you might get the information from our French contemporary, "Photo-Revue," 118, Rue d'Assas, Paris.

BUSINESS REGISTRATION.—Could you tell me if the Registration of Business Names Act requires one to register every year? I believe I saw in the "B.J." a week or so back something to this effect, but cannot trace it. Shall be very much obliged if you would kindly give me the information.—A. A.

Annual registration is not necessary, and no further fee is required unless any alteration is made in the firm or title of the firm.

CLERICUS.—Unfortunately, there are no methods at all exact for exposure of such subjects. The best course is to judge the exposure of the interior by means of a Wynne or Watkins meter used inside the building and then to expose through the blue, green, and red filters in accordance with the multiplying ratio given by Messrs. Wratten for their filters used with their plates. We do not think you would get any satisfactory indications by testing the light outside.

B. E.—A 10-in. focus is about the right length. The Dallmeyer A of 250 mm. would be a good lens, but you can take your choice among portrait lenses of $f/4$ or preferably $f/3$ aperture. Probably your best course would be to state your requirements to a second-hand dealer, and ask what lenses corresponding with them they could offer you. It would perhaps save a good deal as compared with buying new, even if you can get new lenses, which is very doubtful.

W. G. A.—Candles are made of what is practically paraffin wax. The two materials may be used for the same purpose. You can make your white enamel black by stirring in the finest lampblack, although it is doubtful if you will make such a good job of it as buying black enamel The grain weight is the same in apothecaries and avoirdupois Get the finest carborundum powder from Messrs. George Adams, 255, High Holborn, W.C.2, if your regular ironmonger cannot supply you. By using a small bit of glass as a rubber you can grind a very fine grain on glass in any size.

W. W.—The greeting postcards are machine printed on rotary machines from single negatives which are made by photographing a given design with the photograph inserted in it. For example, in the case of the specimen you send, the floral and greeting portion would have a circular aperture cut in it and the photograph placed behind it in making the copy negative. Of course, on the small scale, double printing could be used and design negatives for this purpose are supplied by the dealers, though not, so far as we know, with greeting lettering on them. One firm which makes a speciality of these border negatives is Artista, 5, Rue de Montfaucon, Paris, VIe.

M. J.—It is a little difficult to separate the different disputes related in your letter, but in the first place a reasonable charge for the job mentioned in the first paragraph would be 10s. plus out-of-pocket expenses for taking the negative and supplying one print. Subsequent prints, say, at 4s. a dozen. As regards the cancelled order, it seems that you accepted the cancellation and therefore we see no escape for you from the charge which the engravers have made. Regarding the claim that A ordered no photographs of the mill, but a block, surely the order is established by his acceptance of delivery of the dozen prints. If he has accepted them, then it is clear that the block is a separate transaction.

B. A. E.—Your case is met in a measure by Section 2, according to which any fair dealing with any work for the purposes of private study, research, criticism, review, or newspaper summary is held to be not an infringement of copyright. There has not been a case in the Courts on this point, but it is conceivable that the making and exhibition of a lantern-slide of a work, accompanying a lecture on the subject, would come within "criticism." As a matter of fact, lecturers copy copyright originals rather freely, obtaining permission if they can discover the owner of the right. Damage to such rights is so small that we have never heard of any difficulties arising between a lecturer who has used the work and the owner of the rights in it.

B. B.—(1) With all deference to the writer of the article, our opinion is that for anyone who is enlarging negatives as large as whole-plate a system of illumination by reflected light is preferable to a direct one. Such a system is commercially embodied in an apparatus of Messrs. Marion, the principle of which is that of a white box, in the front of which the negative is placed and strongly illuminated by half-watt lamps arranged at either end. This is much better for even illumination over a large negative. In the case of that suggested, unless you use very thick diffusers, such as opal, and a very high power of half-watt, say, 3,000 c.p., placed some considerable distance behind the opal diffusing screen, you would not get even illumination. And then, of course, you would cut down the power of the light enormously. (2) "Photography of To-day," by Chapman Jones, is altogether a different book from the "Science and Practice," and does not replace it. No doubt Messrs. Iliffe will have "Science and Practice" in print again before long.

B. N.—As regards the addition of formalin to the developer, it is not a good plan for the reason that formalin forms compounds with sulphite which act somewhat in the nature of alkali, and therefore disturb the balance of the developer. You had much better use a fixing-hardening bath of alum, sulphite, hypo, and acid; or, if you want an extra degree of hardening, you can choose from formulæ issued for the tropics. Avoidance of all handling of the films during development is a very great factor in avoiding frilling. We suppose you adopt the usual plan of developing the bands of film suspended in a tank. The Kodak Company has worked out this system very fully for the use of dealers, and supplies the tanks and formulæ for the developer. The usual combination is pyro, metol, and hydroquinone. With regard to printing quickly, presumably on gaslight paper, you must have a box printer, or you will waste an enormous amount of time. With any of the box printers you can arrange stops for the masks, so that very little time is lost in laying down the negatives and paper. The usual plan is to print from the film negative whilst still in one piece, and not to cut up the negative until the order is at the very last stage of return to the customer.

The British Journal of Photography.

Line Advertisements.

Charges for Insertion.

Since advertisements cannot be inserted until fully and correctly prepaid, senders of line announcements are asked to bear in mind the scale of charges. They will thus save themselves delay in the publication of their announcements. A Schedule by which an advertisement can be correctly priced will be sent on request.

Net Prepaid Line Advertisements.

12 words or less 1/-
Extra words ... ... 1d. per word.
(No reduction for a series.)

Special Note. Box Number Advertisements.

"Box No." and office address ... ... charged as 6 words.
For forwarding replies add ... 6d. per insertion for each adv't.
If replies are called for this latter charge is not made.

Advertisements cannot be inserted until fully and correctly prepaid.

Orders to repeat an advertisement must be accompanied by the advertisement as previously printed.

Advertisements are not accepted over the telephone or by telegram.

The latest time for receiving small line advertisements is 12 o'clock (noon) on Wednesdays for the current week's issue.

Displayed Adv'ts should reach the Publishers on Monday morning.

The insertion of an Advertisement in any definite issue cannot be guaranteed.

HENRY GREENWOOD & CO., Ltd., Publishers,
24, Wellington Street, Strand, LONDON, W.C. 2.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3083. Vol. LXVI. FRIDAY, JUNE 6, 1919. Price Twopence.

Contents.

	Page
Ex-Cathedra	305
[illegible] Development	306
[illegible] Photography—II	307
[illegible] of Aerial [illegible] War. By [illegible]	309
[illegible] in the Studio. By [illegible]	312
[illegible] with Printing in [illegible]	314
[illegible] and Rumbling [illegible] Barnes	3[illegible]
[illegible] By [illegible]	3[illegible]7
[illegible] Half-Watt [illegible]	319
A Method of Multiple Gum-printing. By Charles Macnamara	320
Photo-Mechanical Notes	322
Exhibitions	323
Patent News	323
New Materials, &c.	325
New Apparatus, &c.	326
Meetings of Societies	327
News and Notes	327
Correspondence—	
Photographers Names on Post-cards — Reversal in Tank Development	327
Answers to Correspondents	328

COLONIAL NUMBER.

Eleventh Year.

SUMMARY

Mr. [illegible] M. Williamson describes the cameras designed by him during the war for aerial photography, in particular the F type for the exposure of a [illegible] of film and the LB type for plates. (P. 309.)

[illegible] a very simple method of making prints having [illegible] borders is given in an illustrated article on page 314.

The practical methods of chief importance in the taking and printing of [illegible] pictures are the subject of the second of the series of articles on this branch of photography. (P. 307.)

An article by Mr. J. M. [illegible] gives instruction in the making of [illegible] for panchromatic plates and in the testing of them for [illegible] in the [illegible] rendering of various descriptions of [illegible]. (P. 317.)

The use of a high-power half-watt lamp for enlarging on [illegible] is the subject of an illustrated note on page 31[illegible].

The weekly article by "Practicus" has for its subject the portraiture of children. (P. 312.)

The glazing of gelatine prints by stripping is the subject of some practical notes by Mr. C. Brangwin Barnes, who deals particularly with the avoidance of surface markings on prints glazed in this way. (P. 31[illegible].)

Working details of the preparation and use of gum bichromate paper for multiple printing are given by a Canadian contributor, Mr. Charles Macnamara. (P. 320.)

In "Photo-Mechanical Notes" one paragraph describes the making of photo-engraved blocks of lettering to show a shadow effect. (P. 322.)

A light-tight box in the dark room for unexposed plates is a [illegible] accessory which should be more widely used. (P. 306.)

The [illegible] of rendering of delicate tones in light portrait draperies is [illegible] ascribed to its real cause—viz., halation due to the use of [illegible] plate. (P. 306.)

The profile portrait is a style which, with a suitable sitter, lends [illegible] to novel and attractive effects. (P. 306.)

"Colour Photography" Supplement.

Some note define the present position of colour photographic processes and indicate some possible directions of progress. (P. 21.)

Mr. Bertram E. Havelock contributes an article on the effect of the [illegible] in focus in Autochrome photography, detailing methods of [illegible] its effects in practice. (P. 22.)

A portable apparatus for the viewing of colour transparencies has been designed by Mr. Arthur E. Morton. (P. 23.)

Some practical hints on the Paget process appear on page 24.

A note on page 24 provides a guide to the text books on colour photography.

EX-CATHEDRA.

Profile Portraits. We are inclined to think that many photographers do not sufficiently realise the possibilities of profile portraits, while others make a practice of including one in every set of proofs when the features of the sitter render this possible. Very often an uninteresting face with quite irregular features gives a good side view, and if it happens that the outline of the nose or chin is not altogether classical it is much more easy to effect the necessary alterations in a profile than in a full-face pose. There are a few points to be observed, an important one being that the outline of the features should be perfectly sharp. It is well sometimes to have parts of the figure melt into the background, but noses do not come into this category. It is desirable to have considerable contrast between the face and background, the former being in semi-shadow for a white background or in full contrast for a dark one. Some good hints can be obtained by studying the beautiful portrait medallions of Wedgwood which are reliefs in white "biscuit" porcelain upon a blue, green, or black foundation. These effects might be almost exactly reproduced in carbon, since some of the Autotype tissues very nearly match the Wedgwood colours. As the ear is a prominent feature in this class of pose, one must be careful not to exaggerate its size; to avoid this, as long a focus lens as possible should be used. Profiles are admittedly not good portraits, but undoubtedly they have considerable pictorial charm, and are, therefore, appreciated by the more cultivated class of sitter.

* * *

Backed Plates for Portraiture. The majority of photographers have a way of regarding backed plates as necessary only for such subjects as interiors which include windows, and occasionally outdoor subjects which have to be taken against the light. It is true that such subjects very plainly demonstrate the necessity for backing, but there are many portraits which suffer badly from halation without its being recognised. Certainly when a very dark dress is opposed to a white background, or white trimmings occur on a black dress, halation is usually very evident, but we may have a subject which is entirely composed of light tones in which all the more delicate gradations are lost from the same cause without knowing it, attributing it to local over-exposure. Every portraitist appreciates the difficulty of preserving the delicate half-tones in a bridal dress while getting sufficient exposure for the face, and various dodges in lighting, exposure, and development are resorted to in order to get a decent result. If, however, backed plates are used, quite straightforward methods may be employed and perfect gradation obtained. It is well worth trying the experiment of using both backed and unbacked plates upon such subjects and comparing the results. With any great in-

crease of rapidity in the emulsion there is usually an increase in the transparency of the film of bromide of silver, and this naturally tends to favour halation. For the benefit of those who have not studied the matter, we may point out that a great proportion of the light which passes through the film is reflected at a slight angle from the inner back surface of the glass, causing more or less fog at a little distance from the high-light which has caused it. The position of this reflection is probably in one of the delicate shadows the true value of which is destroyed, and this being repeated in a hundred places, the result is a general flattening of the image. We have found some photographers partly obviate this by using a slower plate which has a more opaque film, but a better effect may be produced upon a rapid plate if it is properly backed. Backing is a very easy process if the materials are kept in constant readiness in the dark-room; a few seconds then suffices to apply the colour, and there is no need to wait for the coating to dry. A plate is none the worse for any purpose because it is backed, but those who object to the extra cost of backed plates can back their own when needed at a cost of less than a penny for a dozen half-plates.

* * *

A Dark-Room Plate-Box. In these busy days, when one would expect to find every labour-saving device taken advantage of, it is surprising to find that few dark-rooms are properly equipped for the rapid and safe handling of plates before exposure and development. It is quite the usual thing to find that the plates are filled in direct from the maker's boxes, and there is a great loss of time in opening and closing these, besides a risk of leaving the plates exposed to be spoiled if the light is turned up. It is a much better plan to provide a box, say, 6 x 8 x 8, with a well-fitting lid into which three or four dozen half-plates can be transferred, all facing one way and standing upon their edges. For other sizes boxes proportionately larger will be needed, and all should have the lid so made that either by means of a spring or gravity it will shut automatically. Such boxes have been fitted with an electric alarm which rang as long as the box lid was open, but this seems unnecessary if the lid closes automatically. To receive exposed plates there is nothing better than a cupboard conveniently placed with regard to the sink, with partitions to receive the various sizes. The plates are again stacked on edge in the order of exposure. The front edge of this cupboard should not be vertical, but the top further back than the bottom. The lid should be hinged at the top and weighted with a leaden strip at the bottom. This will keep it tightly closed. Of course, there must be a deep rim or flange all round the door, and the inside of both boxes and cupboard should be dead black.

* * *

Short-Focus Lenses. In the minds of many photographers an impression exists that short-focus lenses necessarily give exaggerated perspective, and that nothing can be done to minimise the defect. If we say that a short studio is to blame we should be nearer the truth, for the fact is that perspective depends entirely upon the point of view, and if this is sufficiently distant the rendering will be agreeable, no matter what the focus of the lens may be. This may be of comfort to those who do not wish to have to be limited in the choice of poses by the fact that they do not possess a long-focus lens. One of the most difficult poses to render without exaggerated proportions is a seated figure of a man with the knees crossed, yet it is often very characteristic of the sitter, and if skilfully managed makes an attractive picture. One of our correspondents, whose largest lens is a 3 B with a focal length of eleven inches, gets over the difficulty by using it at a distance of twenty feet, and disregarding the size of the figure in the original negative. As a matter of fact this is only of carte de visite size, and is subsequently enlarged to whatever dimensions may be required. If only cabinets are wanted they are as sharp as most direct pictures, and a 24 by 18 does not give any impression of fuzziness; in fact, the general definition is far better than if a direct negative of this size had been taken. A little care should be given to the selection of plates for this method of working, as if very rapid emulsions are used the grain is likely to be too much in evidence, but by using a slower plate sufficiently fine definition will be obtained. No fear of long exposures need be entertained, as at this distance there is excellent depth even at large apertures.

NEGATIVE DEVELOPMENT.

It is as impossible to lay down any hard and fast rules for development as it would be to prescribe the quantity of paint and the method of application to be employed in painting a picture, for there is no standard for the quality of a negative, this depending entirely upon the taste and skill of the producer. It is, of course, largely dependent upon exposure, and this cannot be determined even by the most perfect meter. for a theoretically correct exposure which accurately rendered the tonal values of the original would in many cases not give the most pleasing result. As a matter of fact, most satisfactory negatives receive a considerably longer exposure than theory would demand, and development is not carried on until all the affected silver salts are reduced to the metallic state.

Skilfully employed one developing material will give much the same effect as another; that is to say, if we accept the dictum that a perfect negative consists of pure silver embedded in pure, clean gelatine. Pyro is, perhaps, an exception, for here we have a silver image plus a thin image consisting of oxidised pyro, but if the latter be removed by means of an acid-clearing solution the pyro-developed image is no different from any other. The presence of the yellowish pyro image which exists even in an apparently stainless negative adds appreciably to the printing density, so that a thinnish pyro negative will give as bright a print as a much stronger one developed with a non-staining developer such as amidol. That quality is not dependent upon colour is proved by the printing value of wet-collodion negatives, which is unsurpassed. It is a matter of surprise to the modern printer when he is handed a good wet-collodion negative to find what softness and brilliancy can be obtained from a plate which is quite different from any which he is in the habit of handling. Nevertheless, a good pyro negative is highly satisfactory, no matter what class of image is desired, and pyro will doubtless remain a prime favourite with those photographers who think of their prints rather than of their fingers.

There are many factors (not in the Watkins sense) which influence development, the principal being time, temperature, and strength of solution. The greatest degree of control over the character of the image can be obtained by variations in the time the plate is submitted to the action of the developer. Anyone can prove this for himself by cutting a plate exposed upon an evenly illuminated subject into three strips, placing them together in a normal developer and developing for two, four, and eight minutes respectively. Upon fixing, it will be found that there is little difference in the amount of detail visible, but that there is a great difference in the contrasts in the various sections, the first being decidedly soft if not flat, the second of average quality, and the third very vigorous and likely to give a chalky print. It should be generally

known that density can be obtained in less time with a slow or ordinary plate than with a rapid one, and that has given rise to the idea that rapid plates are not capable of giving dense negatives. The experiment just mentioned will prove that this idea is an erroneous one. Other factors than speed of plate may tend to slowness in this respect: for example, a plate made with a hardened film for tropical use is naturally less permeable to the developer than one with a softer film, and at a given temperature will require a longer time to give the same density.

Temperature affects density inasmuch as the action of the developer is accelerated by heat, and that therefore a shorter time is needed to obtain any given strength of image. This is recognised by most operators who warm the developer in winter, and cool it by the addition of ice in summer if the temperature is much above the normal. We have seen a portrait photographer with a large number of normally exposed plates which developed so quickly in a temperature of 80 deg. Fahr. that excessive density was obtained in less than two minutes, on cooling the solution to 60 deg. ordinary density came in three minutes, with no blocking of the high-lights.

The degree of concentration of the developer is another important factor which is not so generally recognised as it should be, although tank development has taught us much in this direction. It is a common practice to employ a diluted developer for subjects having strong contrasts, and soft images are thereby obtained, but this is only a question of time. If we use a solution of Azol one part and water fifteen parts we shall obtain a certain degree of density in five minutes, but with a similar exposure using Azol one part and water sixty parts we shall require at least twenty minutes to obtain identically the same result. So far we believe there has been no definite ratio established between the degree of dilution and the time of development required to give equal density which will hold good with all developers, so that no general rule can be given.

Various developing agents behave differently with plates of the same brand which have received equal exposures; for example, metol causes the image to appear rapidly, but it takes a considerable time to obtain full density. Thus, it has been asserted that metol used alone gives a very thin image. This is not necessarily so, as it is possible to develop a strong black-and-white negative if sufficient time be given. On the other hand, hydroquinone gives density very readily with very clear shadows, hence the popularity of a mixture of these two reagents.

The addition of a soluble bromide has the same effect with all developers, namely, to steepen the scale or increase the contrasts during the earlier stage of development. For this reason it should be put into the solution before pouring upon the plate if over-exposure is suspected. It is of little avail to add it after the image has appeared, and in any case if the image be developed "right out," that is to say until all the reducible bromide is reduced, there will be little difference whether bromide be used or not. As, however, this is rarely done, bromide is rightly retained as being a valuable aid in case of over-exposure.

Effects produced by variations in the proportions of the developer are mainly due to the time factor. For instance, increasing the proportion of soda hasters development, but does not give any increase of detail, as is generally imagined. Hence, there is nothing to be said for the old practice of "working up" a plate by successive doses of one ingredient or other. This was quite an article of faith some years ago, but few hold by it now. It probably originated when ammonia was the alkali almost exclusively used. This is naturally extremely volatile, and soon evaporated from the developer; on the addition of more ammonia the action was renewed, but with the fixed alkalies, such as the carbonates of soda and potash, this is not the case.

With some developers, pyro particularly, the time the solution is kept before using has a considerable effect upon its efficiency. If a freshly made 10 per cent. pyro solution prepared with sulphite and metabisulphite be tested against a similar solution which has been made for three months and kept in a half-filled bottle, the latter will be found appreciably weaker, though there may be little change in colour. Solutions of less strength deteriorate more quickly; the favourite strength of one ounce of pyro to eighty ounces goes off very soon, even a week showing a considerable change.

STEREOSCOPIC PHOTOGRAPHY.

II.—Practical Hints.

As the eyes are generally about 2¾ to 2⅞ inches apart (from pupil to pupil) it follows that the views depicted by the lens upon each retina differ from each other exactly as would the views in a double camera fitted with two lenses separated horizontally by a distance of about 2¾ to 2⅞ inches. Two photographs of an object produced in such a camera would, in fact, correspond exactly with the two retinal images produced when we look at that object, and whatever mental impression is associated with the dual retinal pictures would be equally associated with their photographic counterparts, provided that we view each simultaneously with the eye corresponding to its point of view.

If we only bear this simple correspondence in mind in connection with stereoscopic practice we shall not fail to produce results which will be quite satisfactory, and will appeal immediately to anyone who has normal sight. If, on the other hand, we alter the conditions by placing the two photographs, as is so frequently done, at a distance exceeding the 2¾ inches limit, many people with perfectly normal sight will find it difficult to make the two images blend in the stereoscope, and will only get the effect after waiting for some little time for the eyes to accommodate themselves in the singular way in which they will when conditions are a little outside the appropriate. The temptation to place the prints at a 3-inch interval is often stimulated by the fact that by so doing a wider field of view can be covered. It will be shown, however, presently, when we come to speak of trimming, that there is a much better way of securing the maximum of field than by forcing the eyes to accept an abnormal separation of the images.

No great objection need be taken to the separation of the stereoscopic camera lenses by as much as 3 inches. This involves no strain as long as the resulting photographs are mounted at the right distance apart. The reason of this will be apparent when we come to deal with "giant vision" stereograms. But with regard to the position of the prints themselves even 2¾ inches is a little wider than the extreme separation should be. For perfect effects the range of separation should vary from 2½ inches for foreground objects to 2⅞ inches for objects in the extreme distance, and if this rule is observed the eyes will immediately accommodate themselves, and the picture will always show itself in full relief at first glance in the stereoscope.

With regard to the stereoscopic camera there are many ingenious devices by which an ordinary camera with a single lens may be made to do duty in place of a pair of twin lenses. The double pair of mirrors devised by Theodore Brown is one of the most ingenious of these devices, and no doubt excellent work can be done in that way. The same inventor has other ways of making a single lens

Stereogram from a pinhole negative. By C. E. B.

answer for stereoscopic work. But at the same time these substitutes have drawbacks, and must only take second place as compared with a properly designed stereoscopic camera with twin lenses. The chief desideratum of such a camera is exact equality of lenses in focus, and this essential point is, of course, strictly attended to by all good makers, who also take care that perfect alignment is secured, and that other details of construction are properly regarded. Special plates 6½ inches by 4¼ inches are made, but a plate 5 inches by 7 inches is excellent if the camera will admit of it. For stereograms of objects in which there is no movement an ordinary quarter-plate camera may perfectly well be used, the two pictures being taken successively from view-points varied by an appropriate separation according to the distance of the object. There is, indeed, an advantage here over the twin-lens camera. In the first place, the distance of separation of the two view-points is variable ad lib.; and secondly, the same lens being used, there must be actual identity of size and of focus. The drawbacks in connection with successive pictures are that, of course, this plan precludes any movement, and it also requires no variation of lighting, a factor not always easy to secure in the case of landscape work when the sky is not cloudless. Nor must any change, however minute, occur in the scene depicted between the two exposures.

Perhaps the most perfect stereograms as regards atmosphere and tone value are those produced with the pinhole camera. A monograph by Rev. J. B. Thomson in the "Photo Miniature" series (No. 27 of 1901) gives admirable instructions as to the pinhole stereoscopic camera, which is easily constructed out of an ordinary half-plate box with a central partition added. For landscape and architectural work this very simple apparatus can, in the matter of artistic and natural effects, defy the competition of the best lenses within the limitations of the instrument, but these limitations are, of course, somewhat hampering. The exposure is long, and living or moving objects are quite outside the scope of the pinhole camera. Focussing is not required, but on the other hand the correct placing of the picture in the absence of lens and ground glass is a little troublesome, though with the aid of guiding view-lines on the top and side of camera the difficulty is got over. If the converted plate box is used as a camera a changing bag is necessary in default of the magazine for dark slides.

A point that needs close attention in stereoscopic photography is the choice of subject. For the best effects this should be one in which the receding dimension is conspicuous. Many a scene which for that very reason is not well suited for an ordinary photographic composition has a special charm in the stereoscope. A row of house fronts facing the camera is obviously not the sort of view that commends itself for stereo effects, but a peep along the same row from an appropriate point of view may be just the kind of glimpse that lends itself for stereoscopic treatment. An avenue of trees, an arcade, a sheet of water with reflections, a crowd of people, a well-lighted group of statuary, or a single statue are typical stereoscopic subjects. Also small objects, many of which would hardly repay the photographer with the single lens camera—a teasel (dipsacus), a dandelion seed globe, an orchid, a Japanese toy, and many another unconsidered trifle will become transformed into wonderful visions of beauty when skilfully stereographed.

With regard to the negative, if any error is permissible it must be on the side of over-exposure. An under-exposed photograph never makes a good stereogram, though one that is flat to a fault as an ordinary photograph is often perfect as a stereoscopic view. Detail is the essential; flatness is got rid of by the stereoscope itself. Matt surface prints are not to be commended: the magnifying power of the stereoscope lenses enlarges the fibres of the paper too much. It is better to use a glossy paper; in fact, whatever paper will bring out the greatest abundance of detail.

Assuming that the two pictures are on one plate, it must never be forgotten that the print must be divided and the two halves transposed. The necessity for this is not clearly understood by many workers. The explanation is this. In the camera each lens inverts its image. If we were to keep the print upside down and after dividing it we were to invert each picture separately they would require no transposition, but if (as is naturally the case) we turn the whole print round before we divide it we have already placed the right-hand picture on the left and the left on the right, so that we must transpose to correct this. The simplest way of ensuring correct mounting is to write in pencil R. and L. on the actual right and left sides of the back of the print before dividing it. The two halves will then be transposed in the correct way by attending to these letters when mounting.

It is important that the mounts should not curl, but be very flat, and if any difficulty arises as to this it is best to mount a corresponding strip of plain paper on the other side of the card to avoid warping. This must, of course, be done at the time of mounting, not later.

As to the position of the two pictures no corresponding points even in the extreme distance should be more than 2½ inches apart. A little less than this is advisable, and the foreground objects may have a separation of a little less than 2½ inches. An average of 2½ inches is, in fact, the most comfortable separation distance for a stereogram.

One further point is often entirely overlooked, though it is of great importance. One should always see that the left-hand print includes more of the right-hand part of the scene than the right-hand print, and one should cut the right-hand print so that it includes a corresponding extra part of the scene on the left, which does not appear in the left-hand print. This will increase the total width of the view considerably, and at the same time will throw the stereogram back behind the plane of the card when it is viewed. If, on the contrary, more of the left side is seen in the left picture and more of the right side in the right picture, the result is a weird effect of a scene floating above the plane of the card, like a picture that has come out in front of its frame. The common idea that the lateral limits of the two pictures should be identical is entirely erroneous, and is very disadvantageous, as it contracts the field of the view to a minimum.

For special subjects suited to the use of a single-lens camera and successive photographs it is worth while, if a large number of prints are required, to take two half-plate views at a view-point separation of 4 to 6 inches, according to the subject. Prints from these are mounted side by side and then a reduced negative made of the pair, brought down to such a size as to bring the corresponding points to a lateral separation of about 2½ inches. This negative can then be masked appropriately, and the prints from it will be complete stereograms requiring no dividing or transposing. Pinhole stereograms, of course, benefit materially by this reduction method, and the above plan applies especially to them.

C. E. B.

THE EVOLUTION OF AERIAL CAMERAS DURING THE WAR.

[Among the designers and constructors of cameras used during the war for aerial photography none perhaps deserves greater credit than Mr. Colin M. Williamson, head of the Williamson Kinematograph Company. Certain highly efficient features of aerial cameras were originated by him, and indeed it may be said that one conception of his, originated in the relatively early stages of the war, provided a camera by which subsequent types of aerial camera performed, in the hands of the non-photographic airman, the tremendous services in mapping enemy territory and works which are now familiar history. At our request Mr. Williamson has written the following few pages from which, in conjunction with what has just been said, the value of his work may be judged.—Eds. "B.J."]

Hardly the war the only successful photographs taken from the air were made from lighter-than-air machines for the simple reason that aeroplanes of that time were too uncertain in their behaviour and too shaky to allow of any satisfactory definition at a less speed of exposure than about 1/500th of a second. However, at the outbreak of hostilities observers' pluck rose to the occasion, and as a result some truly amazing photographs were obtained by hanging over the side with a glorified Kodak. As an absorber or damper of the intense vibration of those early machines—and in fact of later models of aircraft—probably the human body has the advantage over any mechanical device, such as an air-cushion, sponge rubber, or the various forms of suspension. The considerable vogue enjoyed by the hand-held camera and its repeated return to popularity may be explained by this fact. Thereafter the trend of design was be traced by the development of the aeroplane itself and to the successive changes in the conditions of aerial warfare.

It was soon found that the ordinary double-back plateholder was unsuitable and very difficult to handle in the air, with the result that an exceedingly simple but ingenious form of changing magazine for the plates was devised. In its original and simplest form—that known as the C model—it consisted of a platform below which, pointing downwards to the earth, was the lens tube with the focal-plane shutter mounted centrally immediately below the platform. Immediately above, mouth downwards, was the magazine of unexposed plates, whilst below the platform, to one side of the lens tube and mouth upwards, was the magazine to receive the exposed plates, its open mouth, so to speak, having a casing over it to provide a light-tight passage along which the plate was guided from the upper magazine to the lower.

It may be said that this model of camera represented the ideas of designers for the Air Force in 1915; it was introduced for the use of airmen early in 1916. At this time—and, indeed, almost to the period of the Armistice—the Air Force, no doubt for good reasons, was pledged to the use of plates, although it can be readily understood that a flexible sensitive material like celluloid film is much more amenable to handling in a camera which is used by a man having the very slightest acquaintance with photographic apparatus; a man, too, whose prime interest is in the mechanism of his flying machine, and who, moreover, is harassed in all kinds of ways in the air—from aircraft fire, enemy machines, etc. Nevertheless, the idea of using flexible film was conceived quite early in the war. In June, 1915, the late Major C. D. M. Campbell asked me to design an automatic camera especially for use in Mesopotamia. As this camera was for map-making purposes over large tracts of unknown country it was considered necessary to handle 250 exposures at one loading, each photograph to measure 5 ins. x 4 ins. There is no need to point out the great

obstacle in the way of designing an instrument to fulfil these requirements if one had to deal with the weight and bulk of 250 5 x 4 plates. Therefore, I naturally turned to the use of film, and, profiting by cinematograph experience, designed an intermittent travelling notion of the film by means of a patent claw punch movement. There have been many inventions of devices for driving cinematograph mechanism other than by hand—for example, clockwork, and electric and compressed air motors. But for a camera to be used on an aeroplane travelling always at a high speed the power was ready to hand in the wind pressure due to the movement of the machine.

The Type F Film Camera.

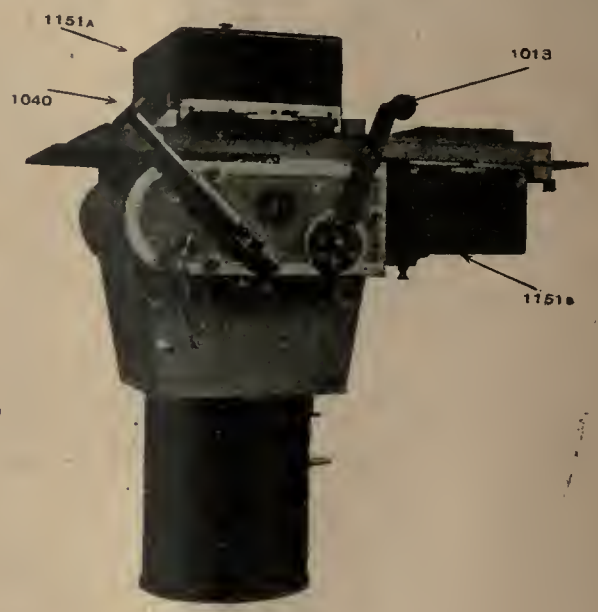
All I had to do—and it seemed a very simple and obvious thing—was to provide a miniature propeller or air-screw on the front of the camera. "Propeller" is, of course, a misnomer, because it does not in this case propel, but is propelled by the wind stream upon it. However, a little air-screw of this kind, measuring only 6 ins. in diameter, was found to provide ample power for the movement of the film intermittently (at any required degree of intermittency) and to operate the shutter. This camera was quickly made, and during the latter part of 1915 proved its efficiency in the Farnborough tests, and was issued for use (as the F) in 1916.

Only a small number—about three dozen—of these cameras were made (their use being restricted to Egypt and the Middle East), but a few particulars might be of interest. Ordinary sensitized film was used in 4-inch widths, coated with negative cinematograph emulsion and wound on spools having black paper ends for daylight loading. This was passed over a focal-plane shutter with separate capping device, and fed forward by the punch and claw movement referred to above, afterwards being rewound automatically on an empty spool actuated by a train of gearing. The travel of the film was intermittent, and after 5 ins. of film had passed over the shutter this was released by a cam action and the film commenced to move again. The speed with which each successive length of film was positioned over the shutter was controlled by a centrifugal "cut-out" governor driven by an air vane attached to the front of the camera. A small lever on top of the camera regulated the position at which the governor "cut-out," and thus enabled anything from one to five pictures to be taken in one minute.

In those days of trials, when queues were formed to wait for instruction or test flights, it was exceedingly difficult to obtain any reliable data, since the patient photographic officer had to put up with a different machine every time he had a test to make on an experimental flight. And some of the early flights were more amusing than instructive. I remember that a Vickers "gun bus" (a pusher type with rotary engine which had seen some service) was first pressed into use for these tests. But the vibration in the overhanging nacelle was so great that the camera had to be bolted to the floor boards to keep it there. In the air it was only possible to make notes by a dot and dash method, so that the effect on the film can well be imagined.

When the first batch of these cameras was made a certain high official, who rather prided himself on the evolution of the cameras, gave instructions for a strip photograph to be made of a certain stretch of the Thames in order to show that the camera would produce a series of exposures without gaps and without undue overlap in the parts of the country recorded. When the film was developed a most mysterious blurring of three or four pictures was found, as well as one or two negatives which were entirely blank. After a lot of learned theorising upon the cause of this defect, it was eventually traced to its source by the admission, on the part of the somewhat irresponsible pilot, that he had looped on the way, just to see how it looked on paper? This is only one illustration of the many little difficulties with which the civilian experimenter had to contend.

Now, as I have said, the Air Force authorities were absolutely immovable in the use of plates, and in fact, about this time, in the use of the 5 x 4 size of plate. No doubt, owing to the greater number of makers of plates, compared with those of film, they were right in this policy. But plates offering more difficulties in the way of changing, it was necessary to provide a means by which the transference of the exposed plate from the upper to the lower magazine of the C type camera could be done with greater certainty than by human operations. A defect of the system was that unless the actuating lever was pushed over as far as it would go the plate (in its sheath) was liable to jam and to put the apparatus out of gear until



Type "L."

it could be put in order again on the return of the pilot. It is due to Major F. C. V. Laws that a camera was designed (the L type) in which the changing of the plates is operated definitely by power.

This camera could be mounted in any desired position in the aeroplane, usually in the fusilage directly behind the observer, and the exposure made by operating a Bowden wire connected to the shutter release. This operation simultaneously engages a train of gearing actuating a sliding rack, which moves the exposed plate into a receiving light-tight box. At the same time the gearing also re-winds the shutter and sets it for the next exposure. The power for these operations is

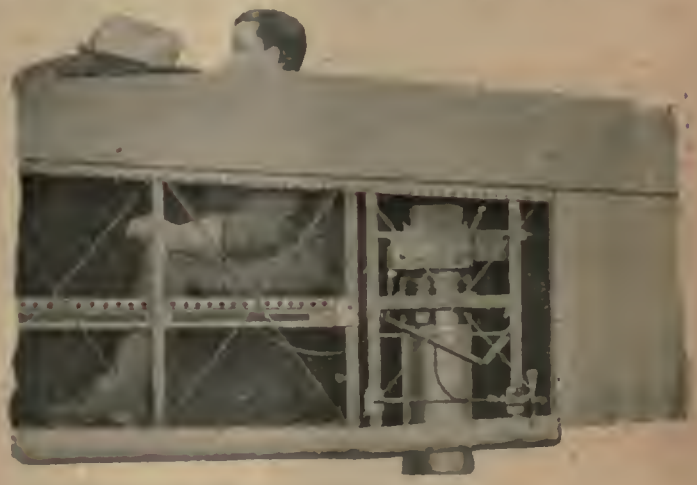
derived from a small wind vane mounted on the side of the aeroplane and connected to the camera by an exposed flexible shaft similar to that used for speedometer drives. It will thus be seen that the airman simply has to pull the lever making the exposure and the camera is then operated automatically by power without further attention. Another great advantage of this type of camera is that it facilitates the use of flexible cradles or vibration dampers for supporting the camera, whereas for hand operation it is necessary to employ some kind of rigid attachment, and this within reach of the airman. Major Laws patented this camera early in 1917, and under his instructions I worked out its manufacture, employing as the power for the changing operation the air-screw used for the film camera. This L type of camera, taking 5 x 4 plates, has perhaps been the one most largely employed by the Air Force. It is made so that it can on occasion be operated also by hand.

Both these principles were adopted in the later model, the LB, which I designed, and which was made by my firm as well as by others. The main object in designing the new model was that, owing to the greatly improved anti-aircraft defences and marksmanship of the enemy, it became necessary to fly at much greater heights in order to attain any degree of safety, and this meant employing longer focus lenses up to 20 ins. Further, photography was now being used for contact patrol work, which meant rapid flights at low altitudes over the enemy trenches and the use of 4 and 6 in. focus lens. The construction of the old L type would not permit of this wide variation in the angle of the light rays, and it was found necessary to employ a self-capping type of shutter. A notable step in advance which was embodied in the LB was the method of fitting this shutter. This was interchangeable, and was so constructed that it could be removed without disturbing other parts of the mechanism. The shutter is a part of the apparatus most susceptible to derangement, and the advantage of replacement in this way was obviously a very considerable one. Other essential features in which this camera scored over

The Type "LB" Plate Camera.

previous models were that all attachments, such as power drive, Bowden release, etc., were made to fasten with spring clips without the use of tools; a great point in considering the extremely awkward and "un-get-at-able" positions to which the camera was often relegated.

Strangely enough, the last new model which I had accepted by the Air Force was an automatic film camera; very similar in action though widely different in design to my first attempt at aerial cameras in 1915. Though very successful in its initial tests, this LF, as it was called, was not completed in time to prove its worth in the field—or, rather, over it—but shows that latterly there was a tendency to use film instead of plates for aerial work. So far as peace requirements, survey work, and other industrial uses are concerned, I have not much doubt but what film will be in greater demand than plates, both from the point of ease of manipulation and lightness. In this latter respect the LF had the great advantage over its predecessors that, though weighing only one-half the LB, the photograph was four times the size, 18 cm. x 24 cm., and the capacity forty exposures at one loading, instead of eighteen. The action of the camera is very similar to the L type, with



The "LB" Type as Mounted on the Aeroplane.

the addition of an intermittently pressure pad to keep the film flat and rigid at the moment of exposure.

For map-making, topographical work, and survey generally, the action of the camera may be made continuous by a simple alteration to the gearing, but in my opinion a narrower film would be more convenient to handle, and could cover the same ground by doubling the number of photographs taken. Say the exposure aperture was 4ins. wide by 10ins. long, the film, travelling at right angles to the direction of flight, would then cover the same track of country as the wider film, with the additional advantage that less covering power is required of the lens. The question of the camera support or fixing in the aeroplane is largely a matter for individual selection to suit the type of machine to be used and the purpose for which the results are required. The swinging cradle, or gimbal suspension, which has been advocated undoubtedly ensures a certain economy of film or plates if correctly adjusted, for providing always a vertical optical axis, and thus reducing the necessity for overlapping. It is doubtful, however, whether the additional apparatus is of great utility, particularly in the modern aeroplane, and also in view of the fact that remarkably good maps have been made with a stable attachment, and that under difficult conditions in the war area.

COLIN M. WILLIAMSON.

HELD OVER.—Owing to the fact that this issue has had to go to press three days in advance of the usual time a number of notes, letters to the Editor, and the report of the lecture by Major F. C. V. Laws, of the Royal Air Force, on aerial photography at the Royal Photographic Society on Tuesday evening last has had to be held over until next week's issue.

PRACTICUS IN THE STUDIO.

[Previous articles of this series, in which the aim of the writer is to communicate items of a long experience in studio portraiture, have appeared weekly since the beginning of the present year. It is not thought possible to continue the series to the length of that by the same writer which ran through the "British Journal" some years ago, but if any reader among the younger generation of photographers, and particularly those engaged as assistants, has a particular subject which might be dealt with, his or her suggestion will be welcomed. The subjects of the previous articles of the series have been as follows:—

A Talk About Lighting (Jan. 3).
The Camera and the Lens (Jan. 10).
Managing the Sitter (Jan. 17).
Backgrounds (Jan. 24).
Studio Exposures (Jan. 31).
Artificial Lighting (Feb. 7).
Printing Processes for Portraiture (Feb. 14).
Studio Accessories and Furniture (Feb. 21).
The Surroundings of the Studio (Feb. 28).
Studio Heating and Ventilation (March 7).
The Postcard Studio (March 14).
The Printing-Room (March 21).
About the Reception Room (March 28).
Home Portraiture (April 4).
Portable Studios (April 11).
Copying (April 18).
Handling the Studio Camera (April 25).
More About Lenses (May 2).
Enlargements (May 9).
Advertising the Studio (May 16).
Mounts and Mounting (May 23).
Business Methods (May 30).

PHOTOGRAPHING CHILDREN.

Much that has been written about child photography is now hopelessly out of date, for the modern juvenile is a very different article from the carefully repressed Victorian youngster. We have only to look at Millais' "First Sermon" to see what the "good" child of bygone days was like and Hunt's "Naughty Boy" to find a good specimen of the bad one. In those days Mr. Robert Faulkner was celebrated for his beautiful child pictures produced on collodion plates, and they would certainly stand comparison with the best of the present-day work. But, fine as they were, they lacked the vivacity of the modern child; there was a general appearance of good behaviour about them, and even when there was a smiling face it was perfectly decorous.

The most important qualification for becoming a successful portraitist of children is a natural love of them, and the next is a thorough knowledge of their little ways. For this reason we now find that a great proportion of the best child pictures are made by women. Nevertheless, I have not found that to belong to the sterner (?) sex is a great disadvantage so long as the photographer is himself willing "to become as a little child" and be one with his tiny sitters. There must be no appearance of hurry about the proceedings, for a few minutes spent in making friends will save many minutes in taking the portraits: an effusive or gushing method of greeting the child often serves only to scare it; in fact, it is often useful to ignore its presence at first, and to let it become accustomed to the studio before addressing it.

The manipulation of the camera should be as unobtrusive as possible; if a capable assistant can take charge of this department, preferably without speaking, so much the better. As, however, studio work is usually a solo job nowadays, as little fuss as is possible should be made. In my experience I have found it to be a good plan to focus upon a fixed point, to have the slide drawn, and to entice the child into the desired place, making the exposure when pose and expression are satisfactory. Many of the old school of operators will perhaps regard this as too risky, but anyone who is used to hand-camera work knows what can be done by judging distance alone without relying upon the focussing screen at all. For this reason I prefer to use a short focus lens—a 10-in. at the most, and very often an 8½-in., with an aperture not smaller than $f/4$. Even with this opening there is a certain amount of depth and a movement of two or three inches backward or forward will not throw the image hopelessly out of focus. Quite recently I photographed an exceedingly restless youngster, who insisted upon talking to me without intermission, swinging himself to and fro as he sat. I chanced the exposure at the end of the swings, and got perfectly sharp results on a sitting pose, while standing ones were obtained by placing some toys on a stool, focussing upon them, and "catching" him when he came to inspect them. All the time he was quite unconscious that anything but amusement was going on, yet the result was four good negatives out of six exposures, which is not bad with a difficult sitter who had baffled two other photographers. This clearly proves that it is quite a mistake to try to treat children as if they were grown up sitters—that is to say, to attempt to pose them in the ordinary way and to trust to their keeping their position till the exposure can be made; "good" children will do this, but, as a rule, the effort to keep quiet is evident in the photograph, and the vivacity, which is the chief charm in a child portrait, is altogether lacking.

Children, it should be noted, do not require the same kind of lighting as adult sitters; they have no lines or wrinkles; their complexions, and in most cases their hair, is light, and a much stronger illumination is possible than with adult sitters. I once had a studio with French windows opening on to a garden, and have made many good portraits with the little model standing just inside the opening; even when the direct sunlight only just missed the figure there was nothing wrong with the modelling. There was the additional advantage that the youngsters could run out on the lawn and sometimes gather a flower or two between the exposures, making the work pleasant for both operator and sitter.

On one point I have long been firm, and that is in only allowing one person to remain in the studio with the child. In my early days I have suffered from mamma, grandma, and nurse all fussing round at once, arranging and re-arranging the clothing, and when one attempted to snatch an exposure simultaneously trying to draw the child's attention. Now I know better, and if it is a choice between mother and nurse, I always endeavour to retain the nurse. I need hardly say that this has to be done with great tact, or serious offence may be given, but I am pleased to be able to say that although I have never kissed the Blarney Stone I have never had any serious difficulty. Whoever stays with the child must keep close to the photographer, so that the child will not be tempted to turn its head from the operator to the third person, and the latter must be cautioned not to speak to the child.

Various devices may be used to attract attention, but care must be taken to avoid an appearance of strained expectancy; a momentary glimpse of a toy will often produce a pleased expression, or with an older child a simple conjuring trick may be tried. To do this I have pressed the bulb with the foot, so that both hands may be free, and this has the additional virtue of entirely concealing any photographic intention. The "little bird" dodge so universally believed in by photographers is a bad one. It may keep a child still for one

exposure, but if there is no bird forthcoming the child will resent it and will not be deceived a second time. On the other hand, a mechanical bird which really sings is a great acquisition in the studio, and will work wonders with almost any average kiddie. Make it sing a note or two, and then tell the little one that it will sing beautifully if he is good, and he will wait happily for the fulfilment of the promise.

Older children, say of ten or twelve years of age, require quite different treatment; they quite understand what is going forward, and their very anxiety to facilitate arrangements is the chief obstacle to getting an animated expression. Even with them it is better to make all preparations as unobtrusively as possible, and, under pretence of waiting for something, to engage them in conversation on a subject that will interest them and put the photography out of their heads. In a minute or two you should be able to learn whether cricket or tennis, Peter Pan or Hawker, river trips or motoring, is a congenial subject. Although I detest the things, I have got a little girl quite enthusiastic over sidecars, and so it is with many other subjects.

I may seem to have dwelt unduly upon the question of securing the sitter's attention and producing an animated expression; but, after all, that is the main thing we have to do if we are to make good child pictures. With adult portraits expression is one of the most important factors; with children it is everything. They are not photographed for the sake of their clothes—very often there is very little to speak of in this line—but expression is everything. Even if the child assumes an awkward pose, though children seldom do, try to secure the expression if it is a good one. I lately saw a beautiful enlargement of a child's head which was a pleasure to look at, even though one had never met the original, and I was shown the negative from which it was made. In this both hands had moved and the legs were actually in a most ungraceful way, but the head was worthy of Raphael and gave me more satisfaction than his cherubs peeping over the frame.

Actual babies—that is to say, children not able to walk—are not very interesting subjects; the most that can be hoped for is to catch a smile. To succeed in this a little knowledge of the routine of baby life is necessary, in fact, I cannot understand how a man who has not brought up a family can manage to tackle babies at all. There are certain times for feeding, outdoor airings, and sleep, and if these are not regarded there is trouble. Such settings are usually by appointment, and whoever makes this should take care to fix the sitting so as not to clash with them. If the mother has previous experience she will raise the question; but if she does not, the receptionist should do so. A hungry or sleepy baby never looks happy, and any attempt to pacify or shake it into activity generally results in squalls, loud and long. In such a case it is useless to waste time, and another appointment has to be made, which could have been avoided by fixing a suitable time in the first place. Many mothers insist upon having very young children taken in a sitting position, although the baby is really not able to sit up properly, and for these I have found the baby-holders extensively used in America, although not often seen here, very useful. A home-made substitute can easily be constructed of wood, giving a comfortable and safe seat in which the mite can neither roll about nor fall forward. It is, roughly speaking, a shallow box with two sides removed and the remaining two cut down in curves, so that nothing is left at the front edge. The sharp corner in front of the bottom is cut into a half-circle and well padded with wool or flock; the sides are padded into a comfortable curve, and the whole covered with soft material. At the back a long, broad tape is fastened so that it can be secured at one end with an ordinary waistcoat buckle; or, if preferred, the two ends can be tied in a bow. The child is seated as in a chair and the tape passed round under the arms and fastened, hiding it as much as possible in the clothing. The skirt can then be arranged and the feet shown. Note—most mothers see great beauty in a baby's toes.

Regarding posing there is little to say, and perhaps the best advice that can be given is the historic, if hackneyed, "*Don't*" of *Punch*. To quote Mr. H. P. Robinson: "The fact is there can be very little posing of a young child; you must do not what you would, but what the child will allow. There is one thing open to you—you may so arrange your furniture and accessories that the child shall ultimately take a good pose." Unfortunately, all operators do not realise this, and wear out their own, the child's, and the mother's patience in attempting to pose the child according to a set formula. I have known such, when they have come across a photograph or engraving which they have admired, to make the most strenuous endeavours to twist their next model into a similar pose. It must never be forgotten that we all have our little peculiarities of pose, and that a position which is comfortable to one person is torture to another. So it is with children. Some will drop into a natural pose which is very pleasing, while others can neither be cajoled nor forced into anything of a similar character.

Only a few words on apparatus and accessories are needed. If there is any choice, the camera should not be a large one, as a small camera is less obtrusive and easier to handle. Some successful operators advocate reflex cameras, but I cannot say that I care for them indoors. A number of dark slides should be to hand, as nothing is so annoying as having to change plates just as a child gets into a happy mood. The camera stand should allow the lens to be lowered within two feet from the ground, so as to enable a child on a low chair or footstool or playing on the floor to be taken without tilting the camera too much. The Hana and Semi-Centennial are stands of this type. If such a stand be not available, it is a good plan to fit a strong square stool with a tilting top so that the camera can be fixed upon it when needed.

For those who prefer it, the child may be raised to a convenient level by means of a platform, and this method has many advantages. In the first place, it is more comfortable for the operator, and, in the second, it keeps the child from wandering about. When artificial light is used, the sitter can be brought nearer to the lamps, with a consequent shortening of the exposure, a consideration often overlooked. The construction of the platform is a matter of individual taste. Some prefer a plain board like a drawing-board with folding legs, but I have found that one made of two boxes, placed side by side, to be most convenient, as it takes up little room and needs no fixing up. Each of these boxes may be 42 ins. long, 21 ins. wide, and 12 ins. high, covered with plain cloth. When in use a soft rug or nursery crawling blanket is thrown over them, and when out of use they can be stood on one side in a passage or corner of the studio, where they can be used as seats.

Some small articles of furniture, such as little wicker chairs and tables, are useful aids to posing, and often take a child's fancy, but I do not care for miniature reproductions of ordinary furniture. They are not found in the average home, and give the picture a made-up appearance. With regard to toys, there is much divergence of opinion. Some pin their faith to them as a means of pleasing the child, while others regard them as worse than superfluous. I think that there is something to be said on both sides. With some children toys will make them oblivious to anything else, and there are then few opportunities for getting a glimpse of the face while others handle them. Other children will show them to the operator or mother in a very pretty way. Care must be taken to avoid metal toys or wooden ones with sharp corners.

PRACTICUS.

MASKED PRINTS WITH PRINTED-IN BORDER TINTS

There is no doubt that in many cases prints from negatives of suitable subjects masked to print with a white margin, and then a border-tint printed in, are remarkably effective, and give an air of distinction which appeals to many. Employing heavy-weight paper, no mount is necessary or desirable, but, naturally, attractiveness will be enhanced if each print is enclosed in a neat folder. As a general proposition, it may be said without fear of contradiction that seductiveness is usually expensive to somebody. As a matter of fact, it generally takes good care that it is, and the present case need not supply the proverbial exception.

Perhaps the simplest form of all combination printing consists in placing a border-tint around the picture, and yet comparatively few printers seem to have clear notions on the subject. A method of registering on the film "Cosway" borders

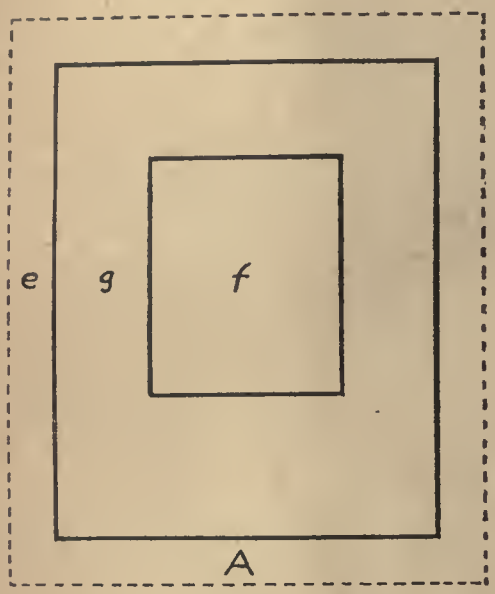


Fig. 1.

was described by the writer in last year's "B.J." The procedure for registering border-tints is on the same lines but far simpler, and a novice, carefully following step by step the following instructions, should experience no difficulty. If the printer be possessed of ingenuity, once the simple principle of the registration is grasped, more elaborate effects can be planned, or the method can be applied in other directions. Some photographers make it a practice of supplying portraits with two or more printed-in tints, often supplemented by narrow lines, all, usually, somewhat faintly printed. These are but an extension of the same idea, but the exact *modus operandi* is not always easy to discover, as tricky dodges may, and in some cases do, form part of the scheme.

No novelty is claimed for the method to be described, though the procedure may have some points of novelty, nor is it suggested that it is the only way; but it is a simple way, one that works well, and takes but little time to put in operation. Platinotype has been employed by the writer, but carbon and the bromide process are equally applicable, the latter with small modifications, which may suggest themselves to suit particular apparatus. No excuse is offered for describing all the steps very fully, as following them in any case is apt to be wearying, which is accentuated by undue compression, even if it does not lead to ambiguity. For the sake of completeness, Fig. 5 is included, showing a border-tint printed around a portrait.

The Masks.

In Fig. 1 the outer dotted lines A represent a double thickness of black needle-paper folded bookwise at *e*, in its folded state a little larger than the size of the printing paper to be employed. Approximately in correct position relative to the margins, describe the rectangle *f* to the picture size required. To prevent subsequent reversal, mark the top T and also the uppermost faces of both leaves, or flaps. Unfold paper, cut *f* out, and preserve the piece cut out. Refold, and with a finely pointed pencil reproduce the rectangle on the underlying leaf (shown in dotted lines on B, Fig. 2), using the edges of *f* for the purpose. Slip a piece of white paper between the leaves, and setting off points from the edges of *f*, describe in correct position the rectangle *g* the size of the printing paper. For a 5 x 4 upright picture masked on 10 x 8 paper, the margins at the sides will therefore be two inches. Many prefer

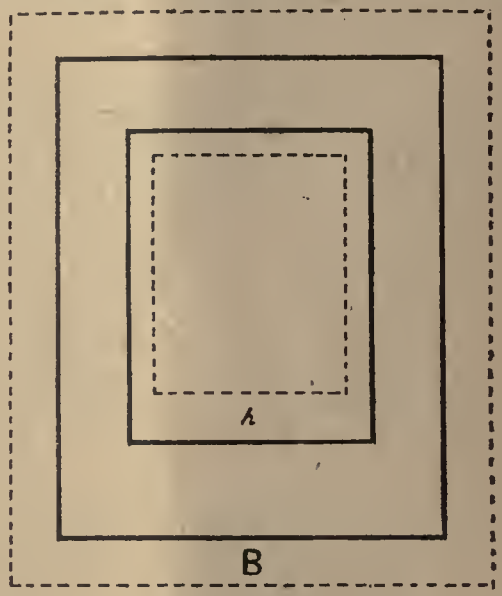


Fig. 2.

the top margin to be of the same width, but this is a matter of taste, and also dependent upon the length of the paper relative to its width, and the proportions of the picture.

It is essential that the left and top lines be drawn in correct position and parallel to the opposite edges of *f*; the lines on the right and at the bottom do not require exactitude; indeed, they can conveniently be set a little further away than the width of the margin determined upon. With the paper folded the rectangle *g* is cut out of both leaves dead on the line on the left and at the top. The line on the left, nearest the fold, *must be cut last*, an obvious necessity, but occasionally forgotten.

We have now secured two masks which, placed against registering marks, or stops, will interchange in exactly the same position. What was the underneath leaf B (Fig. 2) is taken, and setting off points from the rectangle drawn through *f*, a larger rectangle *h* is described, the outside size of the border-tint decided upon, and it is then cut out. Slightly rounded corners are liked by some. The piece cut out of *f* has 1-16 in., or a shade more, trimmed off the top and one side, reducing its superficial measurement by 1-32 in. all round.

Registration.

We have now to register the picture with the border-tint, and protect the former from light-action whilst the latter is being printed. The method first to be described gives soft

outlines to the outer boundaries of the tint, with its inner boundaries vignetted into the picture, a method which does not call for very exact registration; it results in a soft line of demarcation, darker in tone between picture and tint, which in most cases is effective rather than otherwise.

The outer lines of D (Fig. 4) represent a piece of sheet glass

Fig. 3.

the next standard size larger than the printing paper, a 12 by 10 sheet for 10 by 8 paper, for instance. The picture-mask *g* is temporarily placed on the glass and held by gummed strips of paper, or by a weight. (In the diagram the border-tint mask *h* is shown in its final resting-place, but the position is the same.) Three pieces of *thick* cardboard (see *post*), about half an inch square, are coated with adhesive, and pressed up

Fig. 4.

against the mask so as to be just in contact in positions shown, which are recorded in pencil lines on the mask. The piece *f* is taken, a dab of adhesive applied to the middle, and it is inserted centrally in the opening from which it was cut and pressed to adhere. No shift of the mask is permissible during these operations. The picture mask is now replaced by the border-tint mask B (Fig 2), and the latter adjusted to the three card stops, and fastened by gummed strips on the right and at the bottom, and things are as shown at D (Fig. 4), the gummed strips not being illustrated.

Finally, the negative is fixed in a cardboard carrier indicated by the outside lines at C (fig. 3), and its mask adjusted in correct position, secured as first mentioned, and three stops, this time of *thin* card, are affixed exactly as before.

Printing.

The printing paper is adjusted to C (Fig. 3), and pressed against the stops, and when sufficiently printed removed. At this stage we have a print with a white border. It is then adjusted to D (Fig. 4), with a sheet of thin glass the same size as the printing paper interposed between its sensitive surface and the compound mask, which separation vignettes the border-tint into the picture and affords a soft outer edge. Accordingly, the cardboard stops must be slightly thicker than the combined thickness of the interposed glass and the printing paper, or the latter cannot be registered.*

Remarks.

When printing the border-tint a sheet of ground glass over the frame is advisable; with naked artificial illuminants opal glass may be necessary. Some opal glass has been found so wedge-shaped as to afford a tint perceptibly graduated, useful in some cases. If any fairly transparent paper of even texture be at hand it may be substituted for the glass support D (Fig. 4), and will act as its own diffuser.

Should the border-tint be required with sharp outer edges,

Fig. 5.

the procedure is the same as described, except that the intervening sheet of glass is dispensed with, and the cut-out piece *f* is placed on the other side of the glass D (Fig. 4), away from the mask. In this case it is stuck down first and the mask adjusted to it, not *vice versa*. When employing paper as a straight-edge for pencilling, and also when adjusting the stops to the masks, a steel rule pressed down close to the edge will prevent the paper buckling.

* This method suggested an easy way of securing a regulated amount of diffusion in contact prints, described in the current Almanac and in last year's "B.J.," May 3, 1913, p. 203. The effects obtained are often very pleasing.

Alternatives.

The foregoing methods present one disadvantage, inasmuch as the cardboard carrier and mask cannot be used as they are for other negatives, unless the subject happens to compose correctly when a fresh negative is inserted in the card carrier, which is hardly likely to be the case, necessitating removal of the stops and replacing b, others in other positions.

This may be corrected by making a third mask about one inch larger each way than A (Fig. 1), with its aperture (corresponding to *f*) enlarged roughly in the same proportion. Similarly, the cardboard carrier holding the negative will have to be larger than the third mask. The only difference in procedure is that instead of adjusting the picture mask A (Fig. 1) to the negative, it is laid down centrally on, and fastened to, the third larger mask, and the stops are affixed to the latter. This double mask, two-thicknessed only towards the margins, can be adjusted over any negative whose subject is appropriate to the "picture opening," when printing is conducted precisely as before. In addition to the full-sized rubber pad used in carbon and platinotype printing, one rather smaller than the opening in the third mask is placed at the back of the tissue, or printing paper, so as to escape the two thicknesses of the mask, which ensures central pressure and sharp prints.

It will be obvious, when mentioned, that mask B (Fig. 2) need not necessarily be opaque, but transparent in part or in its entirety, a suggestion which opens out possibilities of double tints and other more ornate effects. In such a case, before starting work, it is stuck to A along its left-hand edge.

E. A. S.

GLAZING TROUBLES AND REMEDIES.

Since the start of the great war there seems to have been a recrudescence of troubles in the glazing of prints, more especially postcards. That a lot of the trouble has been caused by the "substitute" chemicals goes without saying, and the short supply of "baryta" has also had a lot to do with it. Apart from these two primary causes, there are several others, most of which, since they are due to faults in the methods of working, are more easily remediable. In the first place, take the case of prints sticking to the glass or other temporary support. This should never occur to the even moderately skilled worker, and should it do so the immediate cause should not be hard to discover. The most probable cause is a dirty or improperly prepared glass, especially when used for the first time. The best method of procedure with new glass is to clean thoroughly with weak ammonia or water, or, preferably, petrol, then to wash away all trace of this, dry the glass with clean linen rag, and then give a coating of ox gall and water (half and half), or even pure undiluted ox gall. Beginners are apt to think that when ox gall is mentioned it refers to the "prepared ox gall" sold by artists' colormen, but for the purposes of glazing prints the ox gall should be obtained from the butcher, who will usually let you have a good supply for a few pence. This, which we will call stock, should be kept in a stoppered bottle, and a few drops of formaline may be added to improve its keeping qualities, more especially in hot weather, or if stored in a warm place. For general use a dessertspoonful of the stock gall should be added to a quart of water, which will be found to make a good working strength. If stronger than this the tendency of the prints will be to drop off the glass when only barely dry, and the high gloss will consequently deteriorate. The best glaze is obtained when the prints do *not* drop off at all, but require just one corner raising and stripping, just as they did in the old days, when we collodionised the glass. Another advantage of stripping versus dropping off is that the prints are flat instead of being curled inwards, and if put under a weight—say, a few boxes of negatives—will remain flat until the order is ready to make up and despatch.

When preparing the plate for the reception of the prints, do not pour ox gall on, but simply take a clean linen rag charged with ox gall—i.e., soaked in the solution and then squeezed out—and wipe the glass with the same; wipe lightly and all over, not forgetting the extreme edges. Then take the prints out of the water and lay carefully on the glass, cover the whole with a sheet of waterproof rubber sheeting—it is immaterial whether the rubber side or the cloth is downward—and squeegee lightly but firmly from left to right to remove any air bells. The form of squeegee differs with different workers. I once knew a man who could obtain good results with a roller squeegee, but where the one succeeded dozens would fail. My personal choice is one made of soft pine, about 15 ins. long and 3 deep, of course with rounded edges. This gives a more certain pressure than the commercial rubber squeegee, besides being much cheaper and less likely to get out of order at the most inopportune moment. Now turn the glass over and examine carefully to see if any trace of air-bubbles remain, and proceed with the other side and stand up on edge to dry. Never place near a fire, or in the sun, until the cards are quite surface dry. If these directions are followed there will be no sticking.

The next trouble that arises is the constantly recurring crop of dull markings, sometimes large, sometimes small, and at others practically covering the whole of the print with wee dots, or, as o North Country folks term them, "blebs." For these the assistant who wields the squeegee usually gets the blame, and not always rightly. An occasional air-bubble will often occur, but that can be usually distinguished from other dull markings by its size and shape. It is these other markings that usually puzzle the worker, and I have personally given much time and thought to trace them to their lair, and then exterminate them. The main cause lies where so many faults have lain before, in the bad washing of the prints after fixation. By bad washing it must not be understood that I mean insufficient washing, for in the production of blebs excess is just as frequently to blame as insufficiency. Should the fixed prints be thrown into a bath or tank and allowed to lie on each other anyhow for ten or fifteen minutes, and then be removed and transferred to the glass, the result will be "blebs." Should the prints be left washing and constantly moving for two or three hours and then squeegeed, the result will be "blebs." The worker, having tried both ways and having obtained a successful crop in each case, at once blames the emulsion maker or coater, but let him try again. Wash the prints in four or five changes of water, turning them by hand the whole time for five to ten minutes, and then squeegee at once without further soaking, and, lo and behold! the "blebs" have gone; the free hypo has been washed out, and the gelatine emulsion has not had time to become decoriated, and so the prints are perfect, at least so far as the glaze is concerned. To prove the correctness of this hypothesis, the reader who is at all sceptical may try the following experiment:—Take a print fresh from the fixing bath and squeegee it. Let another print be thoroughly and carefully washed, and then leave it soaking in water for two days, then squeegee

that and note the results. They will be similar, almost identical, one absolute mass of dull spots.

Air-bubbles arise from one of two causes, either bad squeegeeing—i.e., either insufficient pressure being brought to bear on the prints, or passing the squeegee over the print in more than one direction, and so pressing back air already expelled by the first pass of the squeegee. The latter is a very general cause, but perhaps not so much so as the practice of taking a batch of prints out of the water at once and placing them in position on the glass with an uneven amount of wetness on the surface. The portions where the water has run off at once adhere to the glass and imprison air between them, and the action of the squeegee then churns this air into several small bubbles, or sometimes prevents optical contact over a fairly large space. Prints should be taken from the water singly and placed at once direct in the position they are to occupy on the glass sheet. Movement, either by lifting and replacing or by sliding along the glass, is apt to cause bubbles, and be it noted that the prints should not be placed in actual contact with each other. Better have one or two less on the sheet than, by cramming it to excess, obtain slight overlaps, which not only spoil the effect of the glaze, but cause uneven drying.

As to the actual drying, it should not be too rapid nor too prolonged. Should the prints, while actually wet, be placed near a fire or heating apparatus, or in the sun, the moist heat will cause partial melting of the film and result either in a bad case of sticking or the edges will curl away from the glass, and either the prints will fall off while still damp or they will dry with a patch of glazed surface in the centre and almost matt around. In the latter case they are irretrievably spoiled, as even if again soaked they will never glaze properly. A warm room, or preferably out of doors in fine weather, is the best drying ground for glazed prints, only if there should be a wind it will be necessary occasionally to watch that the glasses are not blown over or the prints blown away.

If the emulsion surface of the paper or postcard is of the dull, semi-matt appearance that has been so often the case of late (baryta again), it may be an advantage, in cold weather, to warm the final washing water slightly, and to omit altogether the alum bath. Of course, the water must not be made sufficiently warm to cause stickiness of the emulsion, only just sufficiently so as to slightly soften, not melt, the surface of the prints.

C. Brangwin Barnes.

FILTERS FOR PANCHROMATIC PLATES.

The advances which have been made recently in colour sensitive plates render it desirable that the users of these should give some attention to the making and selecting of filters. In the early days of orthochromatics, and, indeed, for many years after, the general practice was to be satisfied with any piece of yellow glass or gelatine. Later on, well made filters of stained gelatine cemented between flat glass were on sale. Some of the plate-makers showed commendable enterprise in this direction, although the degree of correction aimed at was seldom much more than sufficient for spring flowers or early summer foliage. Indeed, as colour sensitiveness then stood, full correction for autumn landscape, summer or autumn flowers with their wide range of colour contrasts, and for paintings could only be obtained by the use of a filter requiring some forty times the ordinary exposure. Such prolonged exposures made it difficult to deal with anything but still life and similar subjects, and, even so, the gaps in the colour-sensitiveness made the correction somewhat patchy; orange colours and some shades of green being rendered much too dark.

The advent of the Autochrome and other screen colour plates had the effect of directing popular attention to orthochromatics in general, and several brands of panchromatic plates were produced. Notwithstanding their generic title these plates, although showing great improvement, were not equally sensitive to all colours, and fairly deep filters (say ten times) were still necessary to secure reasonably good correction.

The war, which interfered sadly with photographic activities, had at least the effect of calling attention to British slackness in the matter of dyes in general photographic sensitisers in particular, and successful efforts have been made to recapture and extend this branch of trade and to introduce new and valuable sensitising agents. The plate makers have not been slow in availing to themselves of these new materials, with the result that plates are now obtainable which, although not equally sensitive to all colours, are much more nearly so than their predecessors, and, at the same time, are so rapid that even with a fairly deep filter in use it is possible to give an instantaneous exposure upon a well lit scene and still have a thoroughly exposed negative.

Some of the older filters will give reasonably good results with the new plates and that without prolonging the exposure unduly. A 40-times filter for example may not prolong the exposure more than four or five times, and what is known as a K3 filter will add perhaps a fourth to the exposure.

If, however, the best results are to be got it is necessary that the filter should be adjusted to the plate, and it is desirable that the earnest photographer should be able to do this for himself. The plate-maker may issue filters which are correct for some purposes, but they are likely to fall short when employed in another type of work. For example, with one brand of panchromatic plate spring and early summer flowers and foliage are rendered almost perfectly without a filter; some blues, the blue of the cornflower, being rendered a trifle too light and greyish-green just a little too dark. A light greenish yellow filter which lengthens the exposure by perhaps a fourth or less will hold back the blue till the green is sufficiently exposed. For the deeper tinted foliage of summer a stronger yellow would be necessary entailing an exposure of about one and a half times; a group of strongly contrasted autumn flowers would require a deeper yellow without a trace of green, and an oil painting for which a full palette has been used would require a very deep yellow, doubling the exposure. Obviously it would be absurd to handicap the speed of the plate by using the last mentioned filter in photographing with a hand camera a scene in which full reds did not appear.

It may be said that the prejudice against colour sensitive plates, which existed so long, had its origin in the too prevalent practice of using a stronger filter than was needed, and at the same time attempting to cut short the exposure. Over-correction is due not to the plate but to short exposure coupled perhaps with prolonged development. When there is any doubt about being able to give a sufficiently long exposure it is better by far to substitute a lighter screen and risk under-correction.

The photographer who desires to make his own filters should know something about the materials he has to employ. Optically worked glass flats are sometimes recommended, if truly flat, the price is prohibitive. Patent plate glass of good quality will make reliable filters. The thickness should be in

proportion to the area—for filters 1 inch in diameter, two pieces 1/16 inch thick; for those 2 inches in diameter, 1/8th thick; and for larger sizes, 3/16 or more. The glass must be flat on both surfaces, and as nearly parallel in thickness as possible. If a piece of glass is held at such an angle that the bars of a window are reflected from it, it will be seen that there are two reflections, one from the upper and the other from the under side. If a straight line is reflected as straight, and the two reflections are, and continue to be, parallel as the glass is revolved on an axis at right angles to its surface, the surfaces are reasonably flat. The reflections will probably approach to or recede from each other even if the glass is kept truly in the same plane during examination, and show that the glass is not truly parallel in thickness—that it is, in fact, wedge-shaped. Perfection in this particular cannot be hoped for, but if the thin edge of one piece is laid over the thick edge of the other, no displacement of the image will take place.

Picric acid, ammonium picrate, tartrazine, naphthol yellow, brilliant yellow, filter yellow K and fast green are all useful stains. Some of these came from Germany, and now may not be obtainable; but a new English dye, filter yellow A, has been brought out, and is quite good; with that and the picrates and a bright bluish green, little difficulty should be met with in making up a filter to match any plate. The picrates cut out the blue very sharply, and used alone are quite good when cloud negatives are wanted, but do not work so well when a long range of colours has to be dealt with.

Those who have to make large numbers of filters to standard tints find that the best plan is to add an exact proportion of dye to a measured quantity of gelatine solution and coat the sheet of glass cleaned, vaselined, and levelled, with a certain number of minims to each square inch of surface. Mr. A. J. Bull, lecturing at the Royal Photographic Society, stated that 1 milligramme of filter yellow A to each square inch gave a fairly correct rendering of coloured objects with modern panchromatic plates.

The method has the advantage of standardisation, but presents many difficulties in operation. A fairly large quantity of solution must be made up, as it is desirable to coat several sheets of glass at one time, drying is difficult; worm-markings sometimes appear, and, when every care has been taken, the gelatine will not always strip from the glass. The writer has for years employed a different method: he purchases at a small cost sheets of clear unstained gelatine, as used in bon-bon making and by engravers and others in making tracings of drawings. This gelatine has been treated with formaline or other hardening agents, so is easily handled when wet. It can be bought from J. Bousquet, 28, Barbican, London, E.C., or from L. Cornelissen and Son, 22, Great Queen Street, London, W.C.

The gelatine should be cut into squares a little larger than the finished size of the filter, and some pieces of plain glass (for a temporary purpose to be explained presently) and cardboard should be provided. A little of the selected dye is to be dissolved in distilled water; the strength may be such that a depth of half an inch in a white dish appears somewhat deeper in tint than the filter is to be. A piece of the gelatine is immersed in the solution and allowed to soak till it has taken up sufficient of the colour. If the solution is too strong, the gelatine will absorb it irregularly; it is better to err on the weak side, so that the gelatine becomes quite limp before it is sufficiently stained. It will absorb nearly the whole of the dye if allowed to remain in the solution long enough.

Some arrangement for keeping the gelatine flat while drying is necessary; if pinned up by the corners it will cockle and twist so that when dry it cannot be brought flat again. It must be stretched as a sheet of paper is when a water-colour drawing is to be made. The gelatine cannot be stretched on a board as the two would adhere together, but if a piece of glass (not necessarily plate glass) is laid in the centre of the board the gelatine will adhere at the edges only.

The gelatine will expand considerably, and when stained deeply enough a piece of the cleaned glass mentioned in the previous paragraph is slipped under it and the two lifted out together. The gelatine, being larger, will hang down on all sides. The edges should be lifted up and the glass with the gelatine on top laid on a piece of cardboard, the edges of the gelatine being then stroked down into close contact with the card. The cardboard will quickly absorb the water from the parts of the gelatine in contact with it, and as it dries adhesion will take place. The part of the gelatine which is over the glass will dry more slowly, will contract in drying and become quite flat. When hard, a knife cut round the edges of the support will release the gelatine, which will have no tendency to adhere to the glass.

It is desirable to stain a dozen or more pieces of gelatine with each tint of colour, but in different degrees of shade from a very light tint to the deepest shade likely to be wanted. It is not as a rule wise to mix different dyes, because some mixtures will throw down a precipitate and also because some dyes are so much more readily absorbed by the gelatine than others that no dependence can be placed on the combination. When combination of tints is wanted it is better to use two or more pieces of gelatine in making up the filter.

Before cementing up it is well to make photographic tests, and for that purpose a colour chart is required. Two have been suggested by Sir W. Abney. To make these some dry powder colours are wanted—French ultramarine, chrome yellow, emerald green, and vermillion, also lamp black and Chinese white. These are to be used in the form of distemper, and ordinary photographic mountant is a handier medium than size. Some squares of paper should be coated with the four different colours so thickly that the white paper does not show through. One-inch squares of each colour should be pasted down end to end along the top of a piece of stout card. Some of the white with enough black to make a medium grey is to be painted over a strip of paper and pasted below the row of colours. Now comes the difficult part—it is necessary to darken with black or lighten with white a set of coloured squares to match in luminosity the strip of grey, and quite a number of tests will have to be made in doing so. Blue and red will each require the addition of a little white, the yellow will require the addition of black, and the green may be just correct, or it may have to be darkened or lightened according to the shade of the grey strip. The object is to grade a set of the blue, green, yellow and red squares to match absolutely in brightness the grey strip. When this is done probably no one else will agree that it is correct, but that is of little importance, as no two of the critics will agree as to the correction which should be made. It is important that the grading should satisfy the experimenter, for if that is done all photographs taken with the filter which renders the chart correctly will be satisfactory to him.

When the chart is graded a filter must be made up which will render the grey strip and the row of broken colours below it as a uniform grey tint. This is much more easily done by interchanging the pieces of stained gelatine of different colour and different depths of colour than by mixing dyes in liquid gelatine. The top row of unbroken colours will of course appear in the photograph in different shades of darkness and is useful in showing how such colours will photograph.

The alternative chart is made by coating sheets of paper with the unbroken colours, one each of blue, green, yellow and red are wanted, also one piece of black and two pieces of white paper. A toy electric motor is wanted, and if that or some-

[illegible] similar is obtainable the making of the chart is a much simpler matter than the one previously described. A disc, say [illegible] inches in diameter, is cut out of the blue paper and [illegible] other the same size of white paper. If the paper is thin will have to be mounted on thin card. A radial cut is made [illegible] each from the periphery down to the centre, and it will be [illegible] to interlace these discs together so that any proportion of white can be added to the blue. The motor must have a little [illegible] near the end of the mandrel and a nut outside that. A hole is bored in the centre of the combined disc and it is [illegible] against the drum. The green disc should be 3½ inches [illegible], and being the middle colour requires neither black [illegible] white paper to go with it. The yellow disc is to be three [illegible] in diameter and requires a black disc. The red is to [illegible] two and a half inches in diameter and wants a white disc. When the four discs are mounted the nut is lightly screwed [illegible] and the machine set running. By adding to or reducing the proportion of white the blue can be made to match the green [illegible], and the same will have to be done with the yellow and [illegible] red. If the peripheries of the coloured and the black and [illegible] white discs are divided into degrees and numbered it will [illegible] easy at any future time to reproduce the same arrangement. When all is in order the machine is set running and a suitable filter is made up as in the previous case.

The selected pieces of gelatine should be cemented between two pieces of patent plate glass, round or square as may be most convenient. Canada balsam is used, thinned out if necessary with xylol or benzole, a small pool is poured on one piece of glass, the gelatine is laid gently on top, care being taken to exclude air bells, the other pieces of gelatine and the second glass laid down in the same way. No great pressure should be used in clamping the filter together or it may become distorted while drying. An ounce weight laid on top will be sufficient. Drying should take place slowly at about 70 or 80 degrees F. To prevent the parts slipping and to avoid having to wrench the filter from whatever it is laid upon while drying a piece of paper may be laid over a bit of flat wood the filter laid on that and pins driven round the edge.

In conclusion it may be pointed out that, although the photographs made with such a filter may be scientifically correct, or nearly so, the result may not be pleasing from a pictorial point of view. Let us assume that such a colour chart as first described forms a part of the scene to be photographed; it would be rendered as a flat grey surface with no indication that it was built up of colour contrasts. That is an extreme case not likely to occur in practice, yet in nature we may frequently find objects so uniform in luminosity, particularly in a light summer haze, that a correct colour-rendering would be unpleasantly flat. In such case it may be desirable to use the plate without a filter, or with one which allows the colour contrasts to be perceived. The experience gained in making the filters will be of great service in enabling the photographer to decide which is the best course to pursue.

J. McINTOSH.

ADAPTING THE HALF-WATT TO GASLIGHT ENLARGING.

In our business it is necessary to enlarge from small negatives [illegible] to gaslight postcards and paper. The enlarger is of the vertical type, with an 8½-in. condenser, and the source of light is an ordinary 1,000 c.p. half watt lamp. The dark room is a room built inside another room. The condenser is on a level with the dark room roof, and the light is placed outside on the roof, as shown in Fig. 1. This sketch shows the arrangement.

The image of the filament of an ordinary half-watt lamp, placed vertically over the condenser, is thrown into the enlarging lens in the form of a segment of a circle, none of which passes through the centre of the lens (see Fig. 2), and a very uneven disc of light is projected on to the easel. A side view of the filament throws a more concentrated and stronger image through the *centre* of the enlarging lens. (See Fig. 2.)

If the lamp is burnt in a horizontal position the filament soon sags alarmingly, the lamp rapidly blackens, and it soon fails. The only alternative seemed to be to get a side view

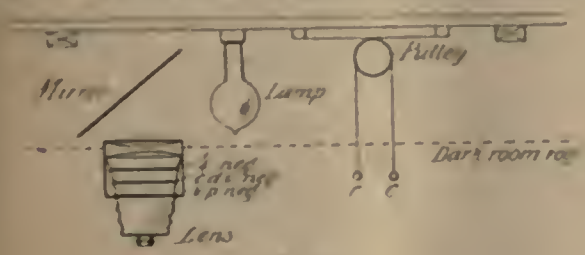


Fig. 1

of the filament shown in Fig. 1—*i.e.*, by means of a mirror. This gives a very evenly illuminated disc, and also a much more luminous one. The lamp can be moved to and from the mirror—in effect to and from the condenser—by pulling one or other of the cords C C to suit different degrees of enlargement. The exposure necessary with a medium-speed gaslight emulsion is 10 to 20 seconds with thin to average negatives and with lens aperture of *f*/6. An arc lamp might in some ways be better; but this arrangement is always ready, is operated and adjusted entirely from within the dark room, and needs little or no attention.

The negatives used vary from quarter-plate down to vest-pocket size, and are put as far as possible from the condenser. Immediately below the condenser is a box with a series of

Fig. 2

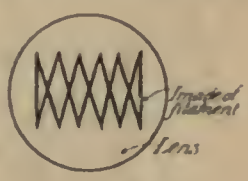


Fig. 3.

grooves, into any of which the plate-carrier can be inserted; and in all cases the negative is put into the lowest groove which allows of it being within the cone of light thrown by the condenser into the lens. (See Fig. 1.) This permits practically the whole of the light from the half-plate condenser to pass through the negative, whatever its size, giving shorter exposures, and tending to uniformity with varying degrees of enlargement, as compared with the usual practice of putting the negative close to the condenser.

The lens used is of the Petzval type of 7-in. focus. In this connection we had an interesting experience. An *f*/4.5 Aldis 7-in. focus was substituted, the idea being to get the best possible definition, especially at the margins. It was found to be very much worse, anywhere. An *f*/4.5 Tessar 7-in. focus was then tried, also an *f*/6.5 Cooke; the former, with quite as bad and the latter with only slightly better results—in all cases at full aperture of the lenses. That three such perfect lenses should fail puzzled us greatly. The result was the same whether the negative was placed close to the condenser or not,

also when ground glass was interposed between light and condenser, and, alternatively, between condenser and negative. The idea that the lenses did not work to focus did not occur to us for some time; but eventually it was found that by moving the easel further away from the lens after focussing a quite sharp picture can be got. The adjustment necessary is such as to throw the image entirely out of focus—in fact, the result is quite "uncanny," and has to be seen to be believed. There may be some rule for the amount of adjustment necessary. In practice the writer can now gauge the distance fairly correctly by the appearance of the image. The Petzval lens works dead to focus at *f*/4 under exactly similar conditions. Why does not the anastigmat? We have seen the effect vaguely hinted at, but not fully described or explained. It does not seem to be due to a "chemical" focus of the lens, as a red or yellow cap on the lens for focussing makes no difference. Stopping down to *f*/11 puts matters right; but if this must be done, why spend good money on anastigmats for enlarging? Our own experience is that there is no lens better than, in fact, none quite so good as, the old Petzval for enlarging from *small* negatives where it is necessary to use apertures larger than *f*/6.

J. C.

A METHOD OF MULTIPLE GUM-PRINTING.

Allowing that it is occasionally possible to obtain in a single printing a gum-bichromate picture, not only with a full range of tones, but of a freshness and spontaneity sometimes lacking in the more laboured multiple print, still the lucky combination of conditions necessary to bring about this happy result occurs so seldom, and "single" prints so repeatedly turn out intolerably harsh, that it must be admitted "single" printing is most discouraging work. In comparison with this uncertainty, multiple printing, if more toilsome, is infinitely surer of its effect, and offers a method unexcelled among pictorial processes for quality, control, permanency, and cheapness of materials.

The great bugbear of multiple printing has been the difficulty of securing accurate registration of the successive printings, and numerous devices have been put forward to overcome this trouble, but they have all proved more or less inefficient, or cumbersome and expensive. The method which I have used for years, and which enjoys the advantages of simplicity and cheapness, is to hold the negative firmly in place in the printing frame by means of a couple of set-screws; and to have the sensitised paper attached to a sheet of glass of the same size as the negative in such a way that the paper, however long it may be soaked, always returns to its original tension on drying.

Any strong paper can be used. Drawing papers like Whatman are excellent, but rather expensive. Heavy linen ledger papers, if procurable without a watermark in the centre of the sheet, are very good, but perhaps best of all are stout cartridge and detail papers, which are both strong and cheap. As a rule the hard surfaced ledger papers do not need any preliminary preparation, but other papers require to be sized.

Sizing.

Gelatine	150 grains	10 gms.
Water	7 oz.	200 c.c.s.

Soak gelatine in water for twelve to twenty-four hours, melt on water-bath, and stir in hot solution of—

Alum	150 grains	10 gms.
Water	5 oz.	150 c.c.s.

Finally add—

Alcohol	1¼ oz.	35 c.c.s.

The paper is pinned by the corners to a drawing board and the sizing is applied hot, and not too thickly, with a flat bristle brush. Two coats are advisable, but the first coat need not be perfectly dry before the application of the second. It is essential to know the sized side of the paper in subsequent operations, and the pin holes automatically indicate which side received the coating, the rough edges of the perforations always being on the under unsized side.

A cleaned-off negative serves very well for the sheet of glass to which the paper is to be attached, but it is better to smooth the sharp edges with emery cloth. The sized paper is cut to a dimension two or three inches larger all around than the glass plate, and is immersed in water for half an hour or so. When thoroughly soaked, it is surface-dried between blotters, and is laid, *sized side down*, on a smooth surface covered with clean white paper—cheap newsprint or wrapping paper will do. The glass is then placed in the middle of the sheet, and the projecting edges of the paper are brushed over with the following:—

Insoluble Paste.

Corn starch	½ oz.	15 gms.
Water	7 oz.	200 c.c.s.
Carbolic acid	10 drops	10 drops

Mix and boil until it turns clear; then add chrome alum 2½ per cent. solution, 1 oz. (30 c.c.s.). Use cold. (This paste keeps indefinitely in a covered jar, but owing to its acid reaction should not be used for print mounting. The water that separates out in time should be poured off.)

The corners of the paper are now cut off with a sharp knife close up to the corners of the glass (Fig. 1), and the pasted

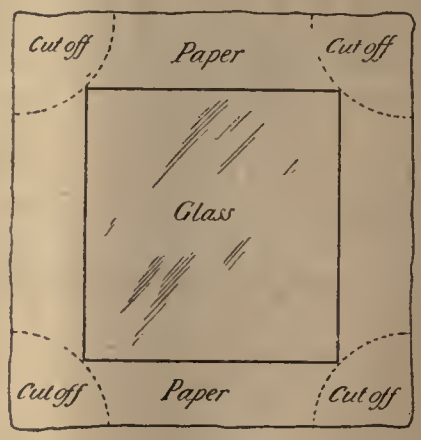


Fig. 1.

edges are folded down over the glass and rubbed into good contact. The "paper-plate" thus prepared is put away between blotters under light pressure to dry.

I prefer a gum solution that has become acid through age, and always keep in reserve a bottleful that may be anything from a month to a year old. As soon as I begin to draw on the reserve stock I prepare another supply to take its place.

Gum Solution.

Gum arabic	2 ozs.	60 gms.
Water	5 oz.	150 c.c.s.
Carbolic acid	10 drops	10 drops

The gum solution is best kept in a wide-necked bottle, over

the mouth of which is stretched a piece of the thin sheet rubber known to dentists as "rubber dam," held in place by a strong rubber band.

For the bichromate solution either ammonium or potassium bichromate may be used. The ammonium salt, being the more soluble of the two, forms a quicker printing mixture with the gum, and is sometimes recommended on that account. Both salts in printing yield an impermanent image that has to be eventually "cleared"; but the ammonium salt, when used in a concentrated solution, gives rise to such an intense image of this kind that the real gum-pigment image is masked to a large extent, and without the trouble of frequent clearing it is impossible to tell when sufficient depth has been attained in the printing. This disadvantage seems to me to more than offset any possible gain in printing time, and so I always use the potassium salt.

BICHROMATE SOLUTION.

Potassium bichromate	1½ oz.	40 grams.
Water	10 oz.	300 c.c.s.

As the solution is intended to be a saturated one at normal temperatures, the exact quantity of the salt is immaterial, provided there is enough.

The sensitising mixture is conveniently compounded in a glass mortar, the pigment being put in first, the gum and bichromate solutions added, and the whole well worked up with the pestle.

The customary procedure is to coat and print for the half-tones first, then for the high-lights, and lastly for the shadows, and the proportions of gum and bichromate are varied for the different coatings. Typical mixtures suitable for thin to normal negatives may be tabulated as follows:—

	Half tones.	High lights.	Shadows.
Gum solution.....	5 parts	5 parts	5 parts
Bichromate solution	8-10 parts	12-13 parts	5-8 parts

For strong contrasty negatives a larger proportion of bichromate solution is indicated throughout.

While the usual order of printing is as mentioned above, it must be noted that there is nothing immutable about this, and if at any stage of the work the values appear false they may be "pulled together" with an appropriate coating.

The pigment is best measured by bulk. In the case of the moist colours the quantity can be gauged by the length of the piece squeezed out of the tube. For dealing with dry colours the tiny chemical scoop listed by some dealers is very handy, or a small bone mustard-spoon may be utilised. The important point is to avoid too much pigment, and the beginner is always astonished at the small quantity required. As a rough indication it may be said that of dry lamp-black as much as will cover a threepenny bit to the depth of about 1-16 inch is enough per ounce of gum bichromate solution for the high light coating; while approximately one and a-half times and twice that quantity are about right for the half-tone and shadow coatings respectively.

But the most satisfactory way to judge of the pigment content is to spread a little of the sensitising mixture thinly on a piece of newspaper. When this is done with the high-light coating the printing should remain practically as clear as ever; the half-tone coating should slightly veil the characters, while under the shadow coating they should be decidedly obscured, but still quite legible. The golden rule is always to use too little rather than too much pigment. Too thin a coating merely means an extra printing, whereas too thick a coating, especially if deeply printed, is likely to ruin the picture.

The sensitising mixture is applied to the paper-plates in the usual way, first being spread as thinly as possible with a flat bristle brush, then softened with a wide camel-hair brush, and finally finished with a badger blender.

The printing frame, shown in Fig. 2, with the back removed, has fitted in adjacent sides two small set-screws which enter the frame just on a level with the rebate. The popular English model of printing frame in which the sides are cut away at top and bottom will need to have a piece fitted to receive the screw. The negative is placed in the frame, and the set-screws

Fig. 2.

are cautiously tightened up, but first, to avoid danger of breakage, a small square piece of rubber about as thick as the glass is interposed between the edge of the negative and the end of the screw. For this purpose I use little pieces of rubber cut from an old eraser. The sensitised paper-plate is now put in and carefully pushed up from the bottom into contact with the top of the frame, and then over from one side into contact with the opposite side. This order of adjustment must be rigorously observed in all the printings, so as to obviate failure of registration due to possible lack of squareness in the paper plate or the frame. For handling the paper-plate the rubber pneumatic plate holder (Fig. 3) used to manipulate negatives during varnishing is a practical necessity. With it the paper plate can be removed and replaced with the greatest facility, and without disturbing the negative.

Printing is, of course, controlled with a print-meter like the Wynne or "Akuret," or one of the other similar models on the market. The development of the paper-plate presents nothing special, and each worker can use his favourite method. My choice is generally a stream of water from a rubber tube attached to the tap, the force of the jet being regulated by pinching the end of the tube. But on occasion I use an atomiser, a swab of cotton wool, or brushes of various sizes and degrees of stiffness.

Development being completed, the paper-plate is put to dry. When I first began practising this method of multiple printing I was much worried by the paper splitting in the course of drying, and this happened even to the strongest kinds, like heavy Whatman. Presently I saw that the annoyance was caused by setting the paper-plate *on edge* to dry. In this position the upper part of the paper dried out first, and, contracting strongly, pulled on the bottom part, which was still soft with moisture, so that the latter frequently gave away.

This trouble is entirely overcome by allowing the paper-plate to drain for a few minutes, first on one end and then on one side, until all the free water has dripped away, and then laying it down *flat to dry*. As drying now proceeds uniformly over the whole surface, splitting of the paper never occurs. If not allowed to drain long enough, however, a pool may form on the surface of the horizontal plate, causing the image to run.

Fig. 3.

If water accumulates between the glass and the paper, in order to let it escape a small piece of the extreme corners of the paper may be pinched off with the thumbnail.

When thoroughly dry, the paper-plate is coated again, and the same procedure as before is followed. It is worth while noting that the actinometer number for any given negative is approximately the same for all the coatings. The exposure required to print the more heavily pigmented shadow coating is not very different from that needed by the more transparent high-light coating, for the opacity is in the coating in the one case and in the negative in the other.

After three or four printings the picture should be "cleared" of the image formed by the bichromate solution in order to see if the permanent gum-pigment image is strong enough. A very efficient bath for this purpose is a 4 per cent. solution of sodium bisulphite, or, as an alternative, we may use:—

Alum	½ oz.	15 gms.
Water	26 oz.	750 c.c.s.
Acetic acid	½ oz.	15 gms.

Clearing is followed by washing for about 15 minutes. Before putting the picture through the clearing bath it is advisable to let it dry and expose it freely to daylight, so as to harden the image. Never cut your picture loose from the glass until it has been cleared, for the removal of the bichromate stain frequently reveals the necessity for additional printings.

Theoretically a gum-print should be completed in three printings, but this implies such a nice balance between coating, printing, and development that I suspect it does not often occur. Personally, I must confess that I have never reached a satisfactory conclusion in less than four printings, while the usual number is five or six, and some troublesome negatives have demanded as many as ten and twelve. In gum-printing it is much easier to give than to take away, and the best and safest method is to build up the picture very gradually.

CHARLES MACNAMARA.

A BIRMINGHAM PHOTOGRAPHER who has sent to the Academy Studios, Limited, 44, Berners Street, London, W.1, a photograph, together with an order for an enlargement, but has omitted to enclose either name or address, is asked to communicate with the Academy Company

Photo-Mechanical Notes.

Relief Half-Tones.

A DESCRIPTION of the way that half-tone of a text in which the letters stand out in relief is made may be of interest.

The text is printed in black ink on white paper, a half-tone negative is made with stop and exposure so that the letters are quite free from dot, while the dot from the paper ground is only a small

Proof from engraving, made as described.

one in order to keep the background dark, though if the background were required a lighter grey, the dot could be larger.

A line negative is now made of the text, and from this, a positive. This positive, having the text in black letters on a transparent ground, is stripped and superposed on the half-tone, being slid just sufficiently out of register to give the shadow effect required to show the relief. This is printed on the metal and the half-tone etched in the usual manner.—A. J. N.

Screeniness in Half-tone Engravings.

SOMETIMES the screen is very obvious in half-tone engravings, even when made with quite fine screens, and this is usually due to a want of harmony between correct screen distance and stop and exposure. If the screen is too close to the plate it may be impossible to use a stop that will give the correct ratio between it and the camera extension, which should be equal to the ratio between the screen aperture and the screen distance, in which case "screeniness" will appear; or the screen distance may be incorrect for the size of the stop chosen, or the ratios may be correct and the exposure too short, when the large dot printing in the high-lights will make the screen apparent. It is essential to have these ratios agree and the exposure correct to ensure the most perfect gradation possible in a half-tone screen negative.

However, this is perhaps common knowledge. What sometimes puzzles engravers is why of two results both made with all these conditions apparently correct, one will appear very much more screeny than the other. The explanation will be found to lie in the relation of the angle of the screen lines to the picture. This is why the experiment, many times revived, to make newspaper engravings with screen lines crossing vertically and horizontally, has never been persisted in for long, and why the four-line screen, which had vertical and horizontal lines, did not succeed.

The cross-line screen is made with lines at 45 deg. from the horizontal for the very good reason that the average human eye is much less easily able to distinguish lines at this angle than it is lines which are nearer the vertical or horizontal, the reason probably being that our eyes have had much more constant exercise in the examination of horizontal and vertical lines and therefore are more easily able to detect them. Consequently it is desirable that the copy is placed on the board so that the screen lines will cross the horizontal and vertical lines of the reproduction at 45 deg. The copy board should be marked with a vertical and horizontal line to which all copies should conform when placed on the board.

For the same reason in three- or four-colour work it is not enough to have the screen angles at the right distance apart to avoid moiré pattern, but the most conspicuous colour in the reproduction, usually the blue, sometimes the black, should be made at the 45 screen angle, and it is because this simple precaution is sometimes overlooked that one colour job looks so much more screeny than another.

Reproduction of X-Ray Negatives.

Medical books and advertisements frequently require half-tone reproductions of X ray subjects. Doctors are in the habit of examining the negative itself rather than the positive made from it, and therefore it is desirable that the reproduction should be of the negative. Unfortunately X-ray negatives are generally extremely contrasty, and therefore difficult to reproduce by putting them in a transparency holder, because before a dot is obtained in the denser parts the detail in the lighter parts is obliterated and the dot overjoined, no matter how small a stop is used. But every bit of detail is usually most important, and must be shown. Whenever the contrast in the original negative is not outside the limits of the screen process, the transparency method is the ideal way to make the screen negative. In most cases, however, it will be found necessary to make a positive from the doctor's negative on a fast plate, so as to secure all detail without too much contrast, and then from this make a print on glossy bromide paper. This should be compared with the original negative, with which it should agree absolutely except for the range of contrast; that is to say, it must show every bit of detail, and if it does it can be used as the original for making the half tone, giving a result that will be surprisingly good. Let it be repeated, the success of this method entirely depends on making the right kind of positive, and it is next to impossible to do this on a process plate.

Applications for Patents.

Relief Plates.—No. 11,512. Process for producing hard relief plates from drawing, photograph, etc., for preparing electrotyped and stereotyped plates, rubber stamps etc. A. E. Harris and A. Ward.

Exhibitions.

LANCASHIRE MASTER PHOTOGRAPHERS.

Coincident with their general meeting and dinner, the Lancashire and District Society of Master Photographers opened an exhibition of professional work at the Blackpool Art Galleries.

Members' exhibits occupied three walls of No. 1 Gallery, the whole of hanging simply aiming at symmetry. As would naturally be expected, there was no standard as regards size or style, mounting or framing, the exhibits representing individual ideals in all these respects. Studio and "At Home" portraits occupied one section, artificial light photographs a second, commercial work a third, and coloured pictures the fourth. The common process, as far as the eye could discern, was bromide, and the sizes were from half-plate to 20 by 16.

The gem of this section was a half-plate child study, by Lord, which for attractiveness, truth, and simplicity was excellent. It was worthy of a larger mount and more prominent position. A pair of artificial light studies by Cyril Foley showed style and pose, and were indistinguishable from daylight work. Over-elaboration of background detail, however, somewhat detracted from the importance of the figures. The commercial section was very small, showing only a few interiors and one or two engineering photographs. The most interesting point here was a good clear moonlight photograph by W. T. Canter.

Prominent in the coloured section was a 30 by 40 canvas of a "Tommy," a life-size half-length by Saronia.

The members' exhibits were mostly unsigned, and, though numbered, no catalogues were obtainable. The fourth wall of the gallery was devoted to camera studies—many striking and one or two fatuous—by other than Lancashire men. The names of Marius Adams, R. N. Speaight, W. Hingworth, and Angus Basil, among others, were well distributed, and did much to add a striking note to an otherwise quiet little show.

FORTHCOMING EXHIBITIONS.

September 13 to October 11.—London Salon of Photography. Entries close September 2. Hon. sec., 5a, Pall Mall East, London, 1.

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Applications, May 19 to 24.

Shutters.—No. 12,523. Focal-plane shutter for reflex and Press cameras. W. B. Wood.

Developing Tanks.—No. 12,823. Tanks for developing photographic films. W. C. Motteram.

Cinematography.—No. 12,688. Detachable label for cinematograph film spools. S. Slinger.

Cinematography.—No. 12,802. Cinematograph apparatus. B. Buss.

COMPLETE SPECIFICATIONS ACCEPTED.

These specifications are obtainable, price 6d. each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

Aerial Cameras.—No. 123,997 (May 13, 1916). The invention relates to aerial cameras, in which the camera mechanism is operated by a propeller or vane rotated by the rush of air due to the passage of the aeroplane or the draught from the engine propeller. The free propeller mechanism first used had the disadvantage that it did not provide for the greater wind pressure when the aeroplane is travelling against the wind than when travelling with the wind, resulting in the camera mechanism operating more quickly and taking more exposures when the

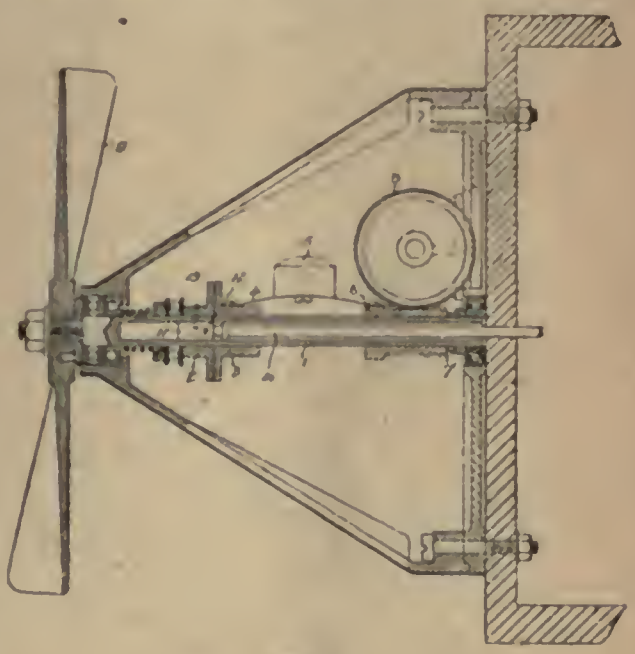


Fig. 1.

aeroplane was travelling slowly than when the aeroplane was travelling at its highest speed. It has been proposed to rotate the propeller shaft in a regular and uniform manner by virtue of an inertia control.

The invention is designed to provide means whereby the propeller shaft is free to rotate at any speed according to the wind pressure, while the speed of the camera mechanism driven from the propeller shaft is governed and runs at a uniform speed without regard to the varying wind pressures to which the shaft is subjected.

Mechanism is provided whereby this uniform speed can be reduced or increased at the will of the airman to give the desired number of exposures over any predetermined distance.

The hollow propeller shaft 1, fig. 1, carries a longitudinally moveable sleeve 2 which engages with the friction disc 3 freely mounted on the shaft 1. A centrifugal governor 5 is attached to the disc 3 and to the driven mechanism 6 by the springs 4 so that, when

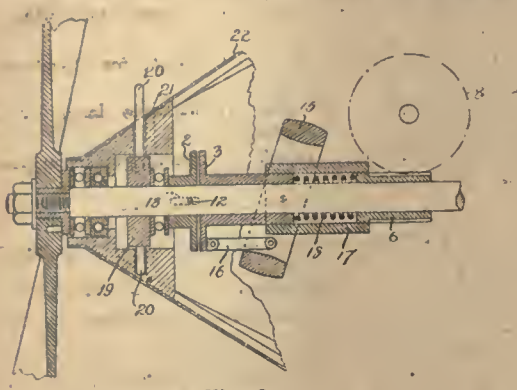
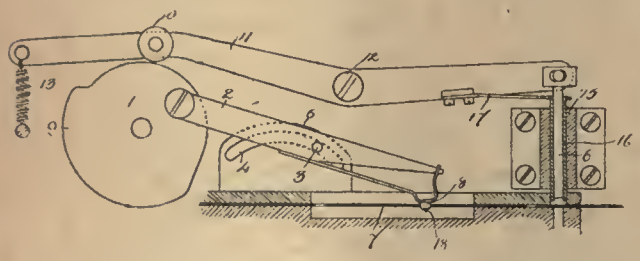


Fig. 2.

the speed becomes too high, the disc 3 is moved out of engagement with the disc 2. The speed may be varied by the operator by moving the disc 2 along the shaft by means of the rod 14, block 11, and the pin 12 carried by the disc. In a modification, the weights 5 are replaced by the ring 15 attached to the disc 3 by the link 16. The position of the disc 2 may be varied by moving the collar 19 by means of the pins 20 working in the spiral slots 21 in the casing.—The Williamson Kinematograph Company, Limited, and Colin Martin Williamson, both of 28, Denmark Street, London, W.C.,

Aircraft Cameras.—No. 123,998 (May 13, 1916). The invention consists in mechanism for aircraft film cameras, whereby the film is firmly held in position during its passage through the camera, comprising a punch adapted to punch a series of holes in the film during its passage through the camera, combined with a feed



claw adapted to give the film a positive travelling motion, said members being so timed that the film is punched at the moment the feed claw leaves the film, while the claw engages in the next feed hole as the punch is released.

In the drawing the disc 1 is mounted on a shaft which is rotated by gearing from a propeller driven by wind pressure. An arm 2 is pivoted on a crank-pin carried by the disc 1, and is guided by a pin 3 working in a slot 4 formed in a plate 5. The slot 4 is shaped so that the claw 8 attached to the arm 2 moves upwards, downwards, and forward in succession, so that it engages in holes in the sensitive film 7 and moves it forward intermittingly. The edge of the disc 1 is formed as a cam which acts on the roller 10 carried by the lever 11 so as to actuate the punch 6 just before the claw 8 engages with the film. At the same time the spring 17 moves the sleeve 16 into contact with the film to facilitate the withdrawal of the punch. A needle point 18 is attached to the claw 8 to feed the film forward before sufficient holes have been punched.—The Williamson Kinematograph Co., Ltd., and Colin Martin Williamson, both of 28, Denmark Street, London, W.C.

Enlarging and Printing Easels.—No. 124,639 (June 1, 1913). An easel, according to the invention, comprises a frame, supported in a vertical position, with a hinged back or flap having an arm attached to it which carries a comparatively heavy ball or weight at its end. The front of the frame is of glass, or may be constituted by the negative when the apparatus is used for contact printing, and the weighted arm is so positioned and shaped that the weight tends to keep the flap tightly pressed against the back of the glass.

To insert the paper it is only necessary to raise the ball, using it as a handle to throw the flap back on its hinges. The paper is then slipped in, and kept in place by the flap when it is

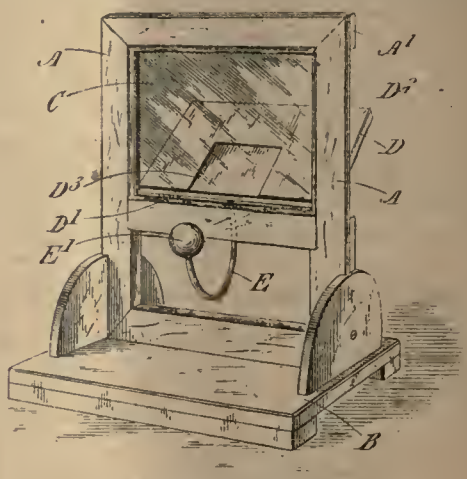


Fig. 1.

allowed to return to its closed position under the influence of the weight. The flap may be lined with felt or like material, such as is usually employed on the backs of printing frames. Conveniently the frame encloses the flap on three sides at the back, but one side is left flush with the glass front so that the paper may be drawn out and inserted easily. Provision may be made for the insertion of masks between the glass and the paper.

For contact printing from a negative of smaller size than the frame, a piece may be cut out of the felt or other material forming the face of the flap to constitute a rebate for the negative, and the negative and paper may be placed in position when the flap is open.

Or, again, in place of the glass front of the frame, there may be inserted a carrier or a series of carriers for the smaller negative, the paper being pressed against the negative by the weighted back, as when the easel is used for enlarging.

In the drawings the frame A is supported rigidly in a vertical position on a base B, and is provided with an opening, which is usually covered by a sheet of glass C, which when desired can be removed from the frame. Behind the frame is a back or flap D, hinged near the bottom of the opening and adapted to close in tightly upon the glass C. When in its closed position the hinged back D is surrounded on three sides by strips A^1 fastened at the back of the frame, but on one side, the right-hand side in Fig. 1, this strip is omitted to facilitate the withdrawal of the glass C or of the printing paper. The face of the flap D is covered with felt or like material at D^2, and the flap is provided with an arm E carrying a weight E^1 so positioned that normally the weight tends to keep the flap in its closed position and pressed with a firm and even pressure on the glass C.

In its normal use as an enlarging easel, a number of duplicate enlargements can be produced very quickly, as it is simply necessary to place the sheet in position on the flap or against the glass, after having lifted the weight E^1 to open the flap, and then to allow the weight to close the flap and press the paper against the glass C. No catches or fastenings are necessary, and as soon as the exposure has been made the paper can be removed after simply raising the weight E^1 again.

For use in contact printing, if the negative is of the same size as the glass C, the latter can be removed and its place taken by the negative. If smaller negatives are to be employed, one or more carriers may be used, the larger carrier fitting into the frame in place of the glass.

Alternatively, a recess D³ may be cut in the felt or other

Fig. 2.

material on the face of the flap D to accommodate the smaller negative and the printing paper at the back thereof.

The construction shown is that of the simplest form of easel according to the invention, and no means are illustrated for up and down or tilting movements of the frame relatively to its base. Such movements are, however, well known in printing frame easels, and may be employed in easels according to this invention. Harold Walter Moyne, School of Photography, Royal Air Force, Farnborough, Hampshire.

New Materials, &c.

Double Weight Cream Carbon Bromide De Luxe. Made by Thomas Illingworth and Co., Ltd., Park Royal Willesden Junction, London, N.W.7.

A NEW addition to the grades in which Messrs. Illingworth manufacture their well known "de Luxe" brand of bromide paper has just been introduced by them, and possesses features which specially recommend it. This "Cream Carbon Surface de Luxe," as it is called, is a double-weight paper—it is made only in double weight—though it may be obtained coated with either the normal or the soft emulsion familiar to users of the ordinary "de Luxe." The feature of the paper is its surface of emulsions (described as velvet) in contrast to the smooth matt of the ordinary grade. Such a surface, in conjunction with the cream tint of the paper, confers on the material a quality which is a very close approximation to that of the collodio-chloride papers, of which, in pre-war days, Continental makers were large importers. As regards the replacement of a print-out collodion paper by one of the development type, we think that here for once we have before us a process which has been going on during the last few years quite apart from the circumstances created by the war. The adoption of development papers has been affected very little by scarcity of those of the print-out type and for years past makers have been turning their skill in the direction of combining the enormous conveniences and speed of development papers with the quality and general appearance of those produced by print-out printing. Such photographers as still hanker after the effects of certain collodio-chloride papers will turn with satisfaction to this new product of Messrs. Illingworth's, and those who know the firm's goods will experience a confident interest in the new addition. As regards the quality of the prints in respect to colour, gradation, purity of the lights, and freedom from mechanical defects, we need only say that it sustains the reputation of the "de Luxe" paper, and we could not perhaps say anything more in its favour.

Criterion Portrait Bromide. Made by Criterion, Ltd., Steelford, Birmingham.

A NEW grade of the bromide papers made by the Criterion Company is one which has been introduced specially for the printing of portrait negatives, or, perhaps we should say, for portraiture printing where the aim is the maximum of detail in conjunction with good brilliancy. The new paper is slower than ordinary bromide, but its lesser speed is still one which makes it rapid in use in the customary printing boxes. From our experience we think photographers will endorse all the makers' claims for the particularly good gradation in the shadows and the purity of the whites. The paper is handled in the ordinary way, and gives by direct development an image of pleasant, warm, black colour. It is issued in four surfaces, namely, matt, silky, cream crayon, and glossy, and in each surface is obtainable in single and double weight, and as postcards.

Professional Flash-Powder. Made by Messrs. Johnson and Sons, Ltd., Cross Street, Finsbury, London, E.C.

Messrs. Johnson and Sons have just placed upon the market a new brand of their flash powder, designed specially for professional use on such occasions where large groups and banquets are photographed by flashlight. The ideal for all such purposes is, of course, a smokeless flash powder—an ideal which has never been, and is never likely to be, realised. Nevertheless, Messrs. Johnson, by means of the use of new constituents in the flash-powder, have produced a preparation which we think is as good as can be made. Certainly it is one which is fully equal in the rapidity of the flash and the thinness and, so to say, "dispersivity" of the smoke to a Continental powder very largely used before the war. A careful comparison test with the new powder against one of the ordinary kind shows that although the smoke at the instant of the flash seems to be very little less than ordinarily, in a few seconds it thins itself and speedily disperses. We imagine that this is due to the much finer state of division of the particles in the smoke, at any rate, the difference is very marked in practical work, particularly where two or three exposures are being made in succession in the same room or hall. It is found that in the case of the new "Professional" powder such successive exposures can be made without any ill-effects on the results with the second, third, or fourth flash, whereas with most ordinary powders the smoke is of a density which calls for a considerable time and thorough ventilation to bring the air into a state for further exposures. The preparation is sent out in the form of two powders, to be mixed just before use, and is supplied with touch paper for ready ignition.

Ilford Tropical Hardener. Made by Messrs. Johnson and Sons, Ltd., 25, Cross Street, Finsbury, London, E.C.

A NEW introduction which, we venture to think, will be accorded a very wide welcome wherever photography is done under tropical conditions has just been placed on the market by Messrs. Johnson and Sons. It is known as the "Ilford Tropical Hardener," being manufactured under a patent of the Ilford Company. It is a clear liquid with some odour of formaline, which for use is diluted with from 7 to 4 parts of water, according to the degree of temperature at which the photographer is working. In this diluted bath exposed plates are immersed, without previous wetting, for three minutes, and are then given a brief rinse before being developed. The bath exerts an extraordinary tanning action on the gelatine film, so that development may be done with any developer at temperatures up to 110 deg. F. without any of the ill-effects of softening, melting, or frilling which are so difficult to avoid at any temperature above 70 or 80 deg. A test which we made shows the remarkable behaviour of the solution. The two halves of a negative developed with a developer compounded with caustic alkali were immersed one in water and the other for three minutes in the diluted hardener bath. On immersing these two halves in water at 120 deg. F. the untreated half immediately dissolved off the glass, whilst the half which had been hardened remained entirely intact, being no softer than a gelatine film developed in the usual way at the normal temperature of 60 deg. F. Inasmuch as the hardening treatment does not interfere with the action of any developer, it will be seen that workers in the tropics have here a most valuable means of combating an ever

present difficulty. Even at the high temperature at which the developer requires to be used, there is no necessity to rush development, so that, apart from the physical preservation of the film, the use of the hardener necessarily contributes to a greatly improved quality in the negatives. Moreover, the hardened film during drying is protected, through the action of the chemicals in the hardener, from attacks by insects. While the hardener is primarily intended for use in tropical countries, it is easy to see that there will be a considerable demand for it among the photographers in temperate climates whose work is put through in the minimum of time, and whose practice in many cases is to make enlargements from the negatives whilst still in a wet state. It is evident to us from the experience we have had of the Ilford hardener that it provides a means of thoroughly safeguarding a negative at this stage without the need of modifying a photographer's present practice other than the use of the hardening bath before development. The preparation is supplied in 3 oz. and 6 oz. bottles.

Ozobrome Materials.—The Autotype Company, 74, New Oxford Street, London, W.C.1, have now, as we intimated a few weeks ago, taken over the supply of materials for the Ozobrome process from its inventor, Mr. Thomas Manly. It is a step which all users of the process will welcome, since the Autotype Company, with its long and pioneer experience in pigment printing, is certainly the best qualified manufacturing firm to undertake the production of the tissues and transfer papers for the sister process. We are quite sure that all the requisites which they supply will be of the high quality which has constantly characterised their own Autotype products. As a reminder to those who may not be familiar with the Ozobrome process, let it be said that this ingenious method of making carbon prints starts from a bromide print or enlargement, which is simply squeegeed in contact with a sheet of pigment paper soaked in the special Ozobrome bleaching and pigmenting bath. After separation the paper can be developed, after transfer, just like any other carbon print. The avoidance of daylight printing and the production of unreversed prints are features of the Ozobrome process which have proved great recommendations, whilst in other respects it has properties of special value to the pictorial worker.

New Apparatus, &c.

The Dependence Print Washer. Made by J. and R. Oldfield Limited, Warwick Street, Birmingham.

A print washer of a very reliable and efficient type is a new introduction of Messrs. Oldfield, for many years wholesale makers of many of the metal photographic accessories, such as dark-room lamps, optical lanterns, etc., sold by the trade. The washer is in the form

of a perforated cylinder, which is turned in a tank by a water-wheel, the prints contained in the cylinder being thus kept constantly in movement in the water. Moreover, the stream of water from the tap is divided into two parts, one passing to operate the water-wheel and the other being led into a pipe placed along the length of the tank containing the rotating cylinder. This pipe is perforated with a series of holes, so that when the washer is in operation fine streams of water are directed inside the cylinder, and serve further to cause circulation of clean water among the prints. The tank in which the cylinder turns is fitted with an outlet syphon, so that, in addition to being kept in constant movement, the water in which the prints soak is automatically removed at intervals and replaced by fresh. It cannot be doubted that in these circumstances the washer removes the hypo from prints very thoroughly in a comparatively short time. Messrs. Oldfield, in the course of designing the apparatus, have had tests made proving that the hypo is completely removed from a full load of prints in half an hour. The washer is made in a series of sizes, the smallest being sold at £1 10s., whilst a size suitable for the requirements of the professional photographer costs £7 10s. A still larger size also adapted for handling lengths of cinematograph film is supplied at £9 10s.

Ideal Celluloid Plate Markers. Made by Messrs. O. Sichel and Samuelson, 52, Bunhill Row, London, E.C.

This is a folder, made of stout celluloid, for the plate-marking of prints or postcards. The folder consists essentially of a base, to which is cemented a piece of celluloid of the size and shape of the plate mark required. Attached to the base is a second sheet of celluloid provided with an aperture registering with the piece cemented to the base. It will be clear that by insertion of a print between the base and the upper piece a plate mark is readily produced by pressure, whilst the print can be easily placed in the correct position, owing to the transparency of the whole accessory. The sample sent to us is one for the plate-marking of postcards printed in strips of six, and consists of a base measuring 14 by 6 ins., and provided with three raised dies measuring approximately 3 by 5 ins. The postcard strip is plate-marked in two steps, inserting into the folder first one part of it and then the other. The folders are made in all shapes, such as square, oval, with rounded corners, and are specially intended for photographs made on the card-thickness paper. While moderate rubbing with the hand is ample to impress the plate mark, the folder can, of course, be inserted in any press, such as that used for dry mounting. Full particulars of pattern sizes, and prices may be had on application to Messrs. O. Sichel and Samuelson.

CATALOGUES AND TRADE NOTICES.

Cristallos Chemicals.—The old-established French firm supplying ready-made photographic chemical preparations under the trade mark of Cristallos, sends us its price list in English of a selection of its products. These include a special tropical developer for the development of plates in hot climates, various single-solution developers, toning baths, dye tinters, and mountant. A copy of the list may be obtained free on application to MM. Cristallos, 67, Boulevard Beaumarchais, Paris.

Lilywhite Service.—Messrs. Lilywhite, Limited, Halifax, Yorks, have just issued a four-page list of their prices for trade printing, etc., for photographers, such as contact bromide and gaslight prints, postcards, and enlargements. The prices are for "straightforward" work; but Messrs. Lilywhite are always glad to quote for special work falling outside this category.

The Lightweight Tent Supply Company, 61, High Holborn, London, W.C.1, send us an illustrated price list of their camping outfits, including sleeping-bags and other equipment, of which they have long made a specialty.

Thornton-Pickard Apparatus.—The 1919 price list of the Thornton-Pickard Manufacturing Company, Altrincham, England, appropriately signifies the large share taken by this firm in the provision during the whole period of the war of photographic apparatus for aerial photography, and for the training of aerial machine gunners. It is a sign of the firm establishment of air machines and aerial photography as military weapons that the company should announce its resources for the supply of such apparatus in the future. The catalogue contains the eloquent appreciation of the work of the Thornton-Pickard Company by Mr. Spencer

Leigh Hughes which we published in last week's issue of the British Journal," and a further feature of it is a collection of reproductions of official R.A.F. photographs, including an early one which served the invaluable purpose of showing the importance of this system of reconnaissance in military operations. As regards the company's well-known ordinary photographic apparatus, the list specifies the several patterns of shutter and the leading lines in cameras, such as the "Royal Ruby" stand camera, folding metal hand cameras, and reflex instruments. A new model of reflex, named the "Victory," is one of the special Ruby series for 3½ by 2½-in. pictures (6½ by 9 cm.), which, complete with Wray "Lustrar" anastigmat of *f*/5.9 aperture, is priced at £12. The list describes other apparatus for enlarging, and is one which the buyer of photographic apparatus cannot afford to be without.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

SATURDAY, JUNE 7.

North Middlesex Photographic Society. Week-end outing to Arundel.

MONDAY, JUNE 9.

Ilford Photographic Society.—Whole Day outing to Friday Street.

THURSDAY, JUNE 12.

Ridley and District Photographic Society. Monthly Competition; "Blue Bells."
Hampshire House Photographic Society "Still Life Photography" A. B. Clark.

News and Notes.

EXHIBITIONS IN 1920.—The series of fairs organised by the Board of Trade will be on a very much larger scale next year as a result of the more or less complete return of manufacturing firms to peace conditions. The Fair will be held partly in London, partly in Birmingham, and partly in Glasgow, each place being chosen in regard to the industries which on the whole are nearest to it. For the first time since the organisation of the Fairs, photographic appliances and equipment, as also optical goods, are to be admitted, the engagements of photographic firms during the war on munitions having precluded their taking part in exhibitions. It is, of course, doubtful whether photographic firms will be largely represented at the Fair, which is to be held from February 23 to March 5, but, however that may be, the visitor to London about this time will also be able to visit the postwar Photographic Trades Exhibition, which it is the intention of Mr. Arthur C. Brookes, editor of the "Photographic Dealer," to organise, for the first time after the cessation of hostilities, on the very successful lines adopted in the past. The buyer of photographic goods for sale abroad should therefore obtain exceptional opportunities and facilities for traversing the whole British market with very little trouble in London in the spring of 1920.

HOUGHTON EXHIBITION AT BLACKPOOL.—In connection with the annual general meeting and exhibition of the Lancashire Society of Master Photographers on May 26, an up-to-date and thoroughly British exhibition of goods was held by Messrs. Houghton at the Palatine Hotel, Blackpool, under the superintendence of Messrs. Ibbs and Richard. Of the professional apparatus shown, special notice is due to the new Ensign drying machine and to a rotary beveller, both of which are arranged to run off the same motor, take up surprisingly little room, and are practically child-adjustable and fool-proof. The dryer occupies something less than a square yard, beats itself in ten minutes, and dries (flat) double-weight prints in 2½ minutes. It is strongly built, and needs the minimum of attention. The beveller is small and strong, and attacks a mount with a clean and easy precision that should make beveling a pleasure. The Ensign printing cabinet for work up to 15 by 12, a neatly built machine, carrying its own table as drop wings, and the well-known "Pawl" machine, were also in evidence, the working of all being ably demonstrated by Messrs. Ibbs and Richard. Plates and papers were also well in view, both being shown by Ilford, Barnet, and Wellington, and the latter by Kosmos, whose Vitegas prints were in charge of the firm's Mr. Simmons. Notable on the Vitegas table were a set of studies by Fielding, a scrutiny of which well repaid the devotees of development papers. Splendid results were shown on Wellington and Ilford papers, and a set of bromide and gaslight prints by Barnet went far to prove that the artistic possibilities of these papers are practically inexhaustible. A neat set of the chief chemicals used in photography completed a very interesting if somewhat compact display.

MAKING WHITE BACKGROUNDS.—For a long time (writes a correspondent of "Camera Craft") I tried to improve the density giving power of my white background by lighting it as strongly as I could from the front, but doing this often interfered with the desired lighting on the subject itself. Then the thought came to me that I might use a ground more or less transparent and give it added strength by lighting it from behind. The plan was tried with very good success. Of course, one must so arrange matters that the light is thrown on the back of the ground at an angle, as a strong light thrown through the ground in the direction of the lens would not be satisfactory. This, however, is not hard to do, and in my case was achieved by cutting a window in the side wall just back of the skylight where the light admitted flooded the space behind the ground being used for my light background effects.

Correspondence.

**** Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

**** We do not undertake responsibility for the opinions expressed by our correspondents.*

PHOTOGRAPHERS' NAMES ON POSTCARDS.

To the Editors.

Gentlemen,—Surely there is some mistake in the imprint of a publisher in the North of England now issuing series of actress and beauty postcards the work of famous London studios. These cards are stamped, "Photo by '———,'" and the name of the firm inserted and *not* the photographer. Is this not a case for the P.P.A.?—Yours faithfully,

"FAIR IS FAIR."

Hampstead, N.W.

REVERSAL IN TANK DEVELOPMENT.

To the Editors.

Gentlemen,—I have read with interest the letters in your journal re reversal in tank development, and would like to mention that I have had a similar experience, having four positives and two negatives on one film. A remarkable thing about it is that the four which came out positives were correctly exposed, while of the two negatives, one was over and the other one under-exposed. This film was developed in a dish and not in a tank, as has been the case with your previous correspondents. It would be very interesting to find out the cause of this phenomenon.—Yours faithfully,

REGINALD E. EDGCOMBE.

10, Lime Grove, Moseley Road, Birmingham.
May 28.

(In its way our correspondent's experience is unusual, although reversal appears to be much more common with roll film than with plates. We still hope that there may be among our readers some who can supply the technical particulars as to plate, developer, etc., in such a remarkable case of reversal cited by our correspondent Mr. Binns, of May 16 last, who, it will be remembered, obtained twenty-five quite good positives during the tank development of nearly a thousand plates, all exposed on outdoor subjects.—Eds. "B.J.")

Answers to Correspondents.

SPECIAL NOTICE.

In consequence of general reduced supplies of paper, as the result of prohibition of the importation of much wood pulp and grass, a smaller space will be available until further notice for replies to correspondents.

Moreover, we will answer by post if stamped and addressed envelope is enclosed for reply; 5-cent. International Coupon, from readers abroad.

The full questions and answers will be printed only in the case of inquiries of general interest.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

E. T. B.—The only gelatining firm we know of is Messrs. McCaw, Stevenson, and Orr, Ltd., 31, Shoe Lane, London, E.C.

R. K.—We thank you for your inquiry, but we have no intention of republishing the present articles by "Practicus" in book form.

D. W. M.—We give the formula and the instructions (the latter are the essential thing) for making the white dextrine photo paste in the "Almanac."

M. A.—The only book which deals with methods of colour photography, such as Autochrome and the Paget process, is "Photography in Colours," by Dr. Lindsay Johnson, and obtainable from our publishers.

G. P.—The usual plan is to let the cards dry on a net only as long as they remain limp, and then to put them in piles under light pressure. It is a help to getting flat cards to print in strips of six and to treat the six-postcard strips as above.

H. A. F.—The particulars given by the makers are:—Focussing scale graduated in metres (equivalent practically to yards); nearest distance of objects in sharp focus when camera is set at infinity, 16 ft.; shutter speeds are 1-4, 1-8, 1-16, 1-32, and 1-64; lens diaphragms, *f*/6.3, *f*/7, *f*/10, *f*/14.4, and *f*/20.

H. A.—You should tell us the smallest portraits you want to take, as that is what determines the focal length which you can use. For C.D.V. full-lengths you can use an 8½-in. lens, but if you do not want to take anything smaller than cabinet full-lengths you can use a 12-in. focus, and this is a very much better choice.

F. R. S.—For your purpose we can suggest nothing better than two pieces of stout lead wire fixed to each end of the printing frame. You can bend these over at any required height in order to support a vignetting card. Lead wire about ¼ in. diameter is amply stiff enough to hold a light card, and can be bent and re-bent into the various positions.

D. F.—Your simplest and best plan will be to raise the roof entirely on both sides so that the eaves are 8 ft. from the floor. You will then be able to use the ordinary size of backgrounds close up to the side. If your roof is in good condition, you will, naturally, use it; but if not, we should advise you to adopt metallic glazing and avoid drips.

OBJET D'ART.—Various additions have been recommended for the bleach in sulphide toning, but there is no particular advantage in the use of any of them. You cannot do better than adopt the bleach formula which we give in the "Almanac," viz., ammonium bromide, 100 grs.; potass. ferricyanide, 300 grs.; water, 20 ozs.

WET-PLATE.—Can you tell me where I can get a book on wet-plate work for a beginner? I want to copy maps, etc. What is the formula?—G. M.

The best book is "The Wet-Collodion Process," by Arthur Payne, published by Mawson and Swan, Mosley Street, Newcastle-on-Tyne, price 3s. 3d.

W. B.—Yes, it will be necessary to register the business. Apply to Registrar of Business Names, 39, Russell Square, London, W.C.1. There is no restriction on your compounding developers, etc., so long as you do not use any scheduled poisons. The only scheduled poison likely to occur in any photographic preparation is mercuric chloride and mercuric iodide.

K. S.—There is some talk of photographers' associations taking up instruction, but it is all very much in the air at present, and it will probably be a very long time before any such instruction gets organised as well as it is organised at the present time by the Photographic School of the Regent Street Polytechnic, which is the best place your son can go to for training to qualify him for professional work.

M. T.—It is not necessarily the fault of the tissue; in fact, unless the tissue is so bad that it will not adhere properly, we do not see how it can be the cause. Apart from defective trimming, such narrow protruding edging may be caused by the prints not being thoroughly dry and undergoing slight contraction in the mounting press. With large prints like yours the contraction could easily be enough to account for the defect.

G. C. S. (Gottenburg).—The stains have all the look of being due not to developer but to the fixing bath. Although you may have fixed thoroughly, as you think, a cold fixing bath will give rise to stains. We prefer not to expose negatives to white light until they have had at least a brief wash from the fixing bath. Some plates will come to no harm if exposed to light as soon as they are in the fixer, but we think our rule is a good one for general practice.

TRISTRAM.—No retouching can be done on such films, but you should try coating the back (where most of the scratches are) with a solution of fish-glue—that is, fish-glue or seccotine mixed with enough water to make it flow freely. Coat both sides of the film with this, and let the coating dry. It dries glossy and even, and will often fill up the scratches sufficiently to get a presentable enlargement. Afterwards the coating can be easily removed by soaking the negative in tepid water.

B. J.—With a total length of studio of 12 ft. you can only get 8 ft. working distance at the best; this is allowing 2 ft. for operator and camera, and 2 ft. for sitter and background. To get a full-length postcard in this space you cannot use a greater focal length than 6 ins. This is really too short for good perspective; but if your customers are not critical, it might pass. You should get fairly rapid exposures with a total of 4,000 c.p., but we should prefer four 1,000-c.p. lamps to the two you mention.

The British Journal of Photography.

The Oldest Photographic Journal in the World.

PUBLISHED EVERY FRIDAY. ESTABLISHED 1854. **PRICE TWOPENCE**

TERMS OF SUBSCRIPTION, POST FREE.

UNITED KINGDOM.—One Year, 10s. 10d.; Six Months, 5s. 5d. Three Months, 2s. 9d.

CANADA ... ... AUSTRALIA ... ... NEW ZEALAND ... ... SOUTH AFRICA ... ... UNITED STATES OF AMERICA SOUTH AMERICA ... ... INDIA AND FAR EAST ... ... CONTINENT OF EUROPE ...	*One Year.* Thirteen shillings (13s.), or 3 dollars 17 cents, or 18 francs 50 cents, or 9 rupees 12 annas, or 6 yens 30 sens.
FEDERATED MALAY STATES, BORNEO AND SARAWAK	5 dollars 57 cents.

HENRY GREENWOOD & CO., LTD., Proprietors and Publishers, 24, Wellington Street, London, W.C.2.

IMPORTANT NOTICE TO READERS.—Until further notice agents will supply the "B. J." to order only, as the high price prevailing for everything in connection with newspaper production prohibit the distribution of surplus copies for chance sales. It is therefore necessary in order to ensure the regular delivery of the "B. J." each week to place an order definitely with a dealer, newsagent or bookstall clerk, or to send a subscription to the publishers.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3084. Vol. LXVI. FRIDAY, JUNE 13, 1919. Price Twopence.

Contents.

	Page
Ex-Cathedra	329
Notes on the Selection of Dark-Lamp Safe-Lights	330
Camera Movements. By D. Charles	331
Practices in the Studio. By Practicus	333
Colour Values in Monochrome, and a New Viewing Filter to Assist in Obtaining Them. By P. F. Renwick	334
Examination Questions in Photography	336
Vertical Photographs of Small Articles	338
Sulphide Toning Modifications	338
Patent News	339
Forthcoming Exhibitions	340
Meetings of Societies	340
Commercial and Legal Intelligence	342
News and Notes	342
Correspondence— South Africa and Assistants—Assistants' Wages — Lancashire Master Photographers' Exhibition at Blackpool	343
Answers to Correspondents	343

SUMMARY.

Some notes on the selection of a safelight for the development of different varieties of plate and in regard to the photographer's optical comfort are contained in a leading article. (P. 330.)

A recent paper by Mr. F. F. Renwick before the Royal Photographic Society has very usefully surveyed recent research in the physical and physiological phenomena which affect the problem of the translation of colours into monochrome. (P. 334.)

We publish the questions (and the answers thereto) set in the recent examination held by the City and Guilds of London Institute in pure photography. Those on photo-mechanical processes will appear next week. (P. 336.)

The article by "Practicus" this week deals with the portraiture of elderly people and points out the descriptions of lighting which are suitable for elderly sitters of different types. (P. 333.)

For the production of colder tones by the customary bleach-and-sulphide method the Rajar Company recommend the treatment of the prints, previous to bleaching, with a weak bath of ammonium sulphide. (P. 338.)

For the photography, with a vertical camera, of small articles such as parts of a machine, an American worker uses a semi-transparent horizontal easel which can be illuminated on its under side, and so gives an improved shadowless rendering of the objects, whilst avoiding the necessity of all blocking out. (P. 338.)

In a contributed article Mr. D. Charles deals with the elements of the movements of a camera. A succeeding contribution will have for its subject the specific uses of the various movements. (P. 331.)

At the Edinburgh Society of Professional Photographers last week Mr. Robert Burns, A.R.S.A., delivered a lecture on composition in portraiture, illustrating his remarks by blackboard skeleton drawings of paintings by Sargent. (P. 341.)

A folding focal-plane camera for roll-film, in which the winding of the shutter also winds the film for successive exposure, has been patented. (P. 339.)

The darkening of proofs on untoned and unfixed P.O.P. is frequently a cause of sitters' dissatisfaction with a portrait. (P. 339.)

EX CATHEDRA.

Acknowledgment. We have to thank many correspondents, comprising both subscribers and those engaged in the photographic apparatus and materials trade, for their letters of congratulation upon the "B.J. Special" issued last week. We are glad to re-echo the note of many of these letters—namely, that the issue is a kind of outward and visible sign of the days of peace for which the world has waited so long. At any rate, if one cannot write "peace" as characterising the state of Europe, nor even disregard the continuance of the prosecution of warfare in some parts of it, an issue such as that of a week ago certainly marks the spirit of confidence which animates the photographic trade as a whole and stimulates it in its combat with the many difficulties which still present themselves. Our readers overseas will have had an opportunity of judging of the multiplicity and many activities of firms engaged in the supply of photographic requisites in this country, in which list, let it be mentioned, are a few firms in France who thus have first addressed themselves to English-speaking users and buyers. We may hope that this overseas number of the "British Journal" is the first of a new series which will maintain and exceed the success of those published in the years before 1914.

* * *

Proofs. Whatever may be the commercial advantages of employing untoned and unfixed P.O.P. prints as proofs, there are, we think, drawbacks which more than counterbalance them. The caution may be given, both personally and in writing, to examine the proofs only in weak light, yet the natural tendency of the public is to disregard this advice altogether. One may see a sitter being handed a batch of sensitive proofs in a reception room to the accompaniment of the usual caution, and as often as not the proofs will be scrutinised in broad daylight as soon as they are taken out into the street. Very likely they will be brought back the next day with the complaint that the sitter's friends do not think that the portraits are good. In such circumstances as these it is common experience that a proof on bromide paper will evoke the opinion that a greatly improved result has been obtained. We think that the advisable course is to finish proofs roughly, either on P.O.P. or bromide, so that there is no chance of immediate fading. They may be defaced by other means, so as to defeat the purposes of unscrupulous people who may try to get something for nothing, but it requires to be recognised that a proof is examined not only by the sitter, but by others of the family, and that therefore is bound to be exposed to more light than an untoned and unfixed P.O.P. will stand.

Focussing V.P. Cameras. At the present time there is a decided tendency upon the part of many photographers to use the vest-pocket camera under conditions where its short focus and large-aperture lens may be employed at its fullest advantage without recourse to stopping down. A short experience with these instruments will readily prove what a simple matter focussing really is. Even when a lens working at f/6 is employed, such a camera is practically a fixed focus instrument, as a simple depth of focus calculation will readily prove. If a 3-in. lens is employed, working at f/6, all objects from about 12 ft. 6 ins. to infinity may be assumed to be sharply focussed, while a very slight variation of the focussing scale will have the effect of giving fine definition over nearer and less distant objects over a long range. If the focussing scale is accurate, experience has taught us that it is far more satisfactory to rely upon this, together with a direct-vision view-finder than upon examining the image upon the tiny focussing screen. Much of our own work has been done upon roll-film, and we never remember feeling the lack of a focussing screen, nor were the negatives anything to complain of as regards sharpness.

* * *

The 1919 Salon. The prospectus and entry form of the forthcoming London Salon is now obtainable from the honorary secretary, Mr. F. J. Mortimer, 5A, Pall Mall East, London, S.W.1. The exhibition will be held from September 13 to October 11, and the last day for receiving pictures at the Pall Mall Gallery is Tuesday, September 2. Special emphasis may be laid upon the condition that no pictures are to be framed. Those sent by exhibitors in the British Isles may be mounted, but contributions from abroad must not even be mounted. As in the last two or three years, it is the intention of the Salon Committee themselves to arrange for the display of the pictures under glass, according to a scheme which has been successful in ensuring a pleasing appearance of the walls as a whole. This policy will be assisted if exhibitors as far as possible will employ mounts of one or other of the sizes 15 x 12, 20 x 16, and 25 x 20, in no circumstances larger than the last named. Wherever possible a white or light-tone mount is preferred. An entry and packing fee of 3s. is charged to each intending exhibitor, this amount covering any number of pictures.

* * *

Panchromatic Negatives. Many photographers fail to obtain the most satisfactory results on panchromatic plates through omitting to give sufficient exposure. It is a fact not generally realised that in order to obtain a satisfactory rendering of the more difficult photographic colours, such as dark reds, greens, yellows, etc., ample exposure is essential, in order for them to be fully impressed upon the emulsion. Another misconception also exists as to the type of negative most to be desired. Panchromatic plates will be found to give negatives rather different looking from those on ordinary brands, due to the fact that they contain a far wider range of tone. In order to obtain the full advantage of these tones the negative needs to be developed in order to bring out its full range of tonal qualities. It is a good plan to develop slightly further than would be the case with the ordinary emulsions in order to bring this about, though care must be taken not to carry the operation too far, or the snowy effect, almost like over-correction, which is sometimes encountered in panchromatic work may be met with. As a means of securing the best results, development by the tank method, using a time and temperature system, has much to recommend it.

NOTES ON THE SELECTION OF DARK-LAMP SAFE-LIGHTS.

After all that has been said and written on the subject, it is rather remarkable but nevertheless true that many photographers, amateur and professional, still regard the safety of their dark-room illumination in terms of dimness, with little regard to the spectral quality of the light transmitted by the window of the lantern. Other things being equal, naturally the dimmer the light the safer it will be, but a comparatively bright light may be perfectly safe for the usual period plates are exposed to its rays, whilst a far dimmer light may have a distinct tendency to cause fog. The plate-maker certainly does use a very feeble red illumination, otherwise the margin of safety from fog allowed to the photographer would be lessened owing to the cumulative action of light.

The familiar canary and ruby fabrics, on the market now for many years, are useful in some cases, but they materially cut down the general illumination, and the former is not to be advised for rapid plates. As they are loaded with coloured materials, if subjected to much handling, a crop of pinholes in course of time appears. Not a few employ ruby glass, which, if deep, also reduces the illumination seriously, and, what is far worse, often permits a miscellaneous transmission at the violet end of the spectrum. It is really astonishing how much blue some commercial ruby glass does let through, whilst other samples have been found satisfactory; but as the eye cannot detect one from the other, unless a spectroscope is available, ruby glass is better avoided unless it can be combined with a yellow or orange screen, known to cut off the blue and region beyond it, including the ultra-violet. Perhaps the "ultra-violet" is somewhat in the nature of a bogey with such lantern illuminants as oil, an ordinary gas jet, or carbon glow-lamp, if otherwise with incandescent gas and in particular metallic filament lamps. With daylight the question of ultra-violet absorption is of importance, and many yellow dyes cutting the blue and violet, transmit an appreciable amount of ultra-violet.

To the busy professional the making of safe-lights is not a practical proposition, and unless the requisite dyes are at hand their purchase at present prices will effect but little saving, even if the labour involved is not considered. Speaking generally, it may therefore be said that safe-lights are better bought and not made, and apart from any question of cost, when purchasing the commercial article we have an assurance that dyes are employed giving the maximum safety for a given amount of light.

The only point then to consider is what particular safe-light to select. With panchromatic plates no question arises, as every prudent worker will follow the direction of the plate-makers. Occasionally it has been thoughtlessly assumed because a particular green safe-light is advised for panchromatic plates that a green safe-light designed to be used with "ordinary" plates will be suitable for the so-called yellow sensitive ortho' plates. But as these record yellows mainly by the green contained in them, a ruby light for these plates is obviously to be preferred. The panchromatic special safe-light is adjusted to transmit a narrow region of the spectrum to which the plate has merely lessened sensitiveness, and the extreme feebleness of the illumination is the chief protection against fog.

For slow and medium speed, and for ultra-rapid "ordinary" plates, the purchase of safe-lights respectively designed for such will also be safe, but this may mean the selection of a red or ruby for the latter, which to many

eyes is tiring, and to some actually distressing. In one case met with, the photographer experienced partial blindness when working in a ruby light for some time, though no ill-effects were felt with a yellow-orange light; probably due to the percentage of green transmitted. Not without reason, commercial safe-lights are designed to be reasonably fool-proof, and therefore err well on the side of caution. It sounds like a "fisherman's yarn," but some years ago a cheerful soul purchased a panchromatic safe-light, and with great confidence in the appellation celebrated the occasion by installing a small electric arc in the dark-lamp. The illumination was extremely good and the fog pronounced.

The choice of a safe-light, considered with regard to such comfort of the dark-room operator as is consistent with a sufficient degree of safety, is therefore of real importance, but one often neglected. No general rule can be laid down, so much depending upon the conditions—intensity of illuminant, method of working, etc.—but it may be said that an orange safe-light listed for slow and medium speed "ordinary" plates will be found quite safe for ultra-rapid plates if they are not unnecessarily exposed to the light. Obviously, if tank development be employed, a far brighter light is permissible than when constantly inspecting progress of development. If green-sensitive ortho' plates are only occasionally used, a sheet of ruby glass, or piece of ruby fabric placed in front, will make a satisfactory substitute for the appropriate commercial article.

Some time ago an enthusiastic amateur, writing in an American periodical, strongly recommended a certain ortho' plate, one reason given being that it could be developed in a yellow light. This was rather a back-handed compliment to the plate in question, but it is a fact that with care plates can often be developed without fog under conditions which may appear highly dangerous. In one instance a safe-light for slow bromide and gaslight papers in front of an incandescent gas jet had to be employed when developing plates of extreme speed. They were, naturally, kept carefully shielded until towards the end of development, but were then held up close to the window to enable density to be judged. Possibly latent fog was induced, but had insufficient time to develop up in the short period which elapsed between inspection and fixing; at any rate no perceptible fog appeared in the fixed negatives.

Although it has been suggested that as a general rule it is better to purchase safe-lights instead of making them, yet there are always some who pride themselves on employing home-made articles so far as possible, and no one will quarrel with the spirit which animates the mechanically minded fraternity. In the present case the manufacture of safe-lights certainly presents no mechanical difficulties, and precise instructions for making them appear each year in the "B.J. Almanac." These, however, deal with measured quantities of gelatine and dyes applied to the glass, and our experience is that comparatively few will go to the trouble of coating.

A safe-light we have used for years, capable of withstanding a hot lantern, consists of two waste negatives from which the silver had been removed by a strong permanganate reducer, followed by a bath of sulphite of soda (to remove stain), and the usual wash; the gelatine being then dyed-up with a 15 grain to the ounce solution of tartrazine, one of the best yellow dyes for the purpose. They were bound together with a sheet of paper, similarly dyed, interposed. In front of an 8-c.p. carbon filament lamp the light appears of distinct orange hue, though not approaching what would be generally considered as "orange-red." Many have expressed surprise that a bright light of such a character is permissible, yet used with reasonable care it has been found perfectly safe with the fastest plates of "ordinary" brand. The gelatine was varnished as a measure of precaution rather than necessity, and the paper employed, very absorbent and fairly translucent, was that sold for manifolding typewriting. Tartrazine is a pre-war dye of Hun origin, but "acid-yellow 72910" of the British Dye Co. is stated to be its equivalent, and we have little doubt it will answer the purpose satisfactorily, as may indeed other yellow dyes. For ortho plates a sheet of ruby glass can be placed in front, or, if not at hand, another waste negative can receive the preliminary treatment mentioned, and is then dyed up with methyl-violet, about three grains to the pint. If dyed too deeply little light will pass.

CAMERA MOVEMENTS.

Occasionally, even in this twentieth century, amusement is caused among photographers by the naive surprise of some people at the total absence of "works" inside even the most expensive camera. For all that it may truly be said that many experienced photographers do not clearly understand the object and use of the various "movements" which usually are all outside the camera. Many produce good results by a sort of instinct acquired rather as a result of long practice than by exact knowledge of how and why a particular adjustment will achieve a desired object. Knowledge of these matters must obviously save a beginner in photography much trouble as well as many plates, and later on will enable him to tackle difficult problems by reasoning out in a logical manner the best and proper procedure to follow, instead of the unfortunately rather prevalent "hit or miss" methods.

There are several distinct moving parts which may be employed separately or in combination to achieve specific objects, and they are quite easy to understand if examined and experimented with one at a time in a systematic and leisurely manner without using any plates at all. In fact, I advise anyone buying a camera to try all its movements carefully in this way before exposing a single plate. I do it myself with every camera I have occasion to use, although (or perhaps it is *because*) I've been over twenty years "at the game."

Before even trying the "movements" there are a few preliminary facts to be digested, and I put forward also a few suggestions that will be found to make easy the study of the camera's "works." The lens and the ground-glass are the principal parts of the camera. The lens has all sorts of peculiarities, most of which are best left alone by the beginner for a time, but its purpose is to throw such rays of light as reach it from each point in the "subject" to a corresponding point on the ground-glass. The purpose of the ground-glass is to allow the photographer to see whether the lens is doing that or not. The camera bellows and body are to keep all other light off the ground-glass except that which comes through the lens. The "movements" of the camera serve the purposes of adjusting the positions of the lens and of the ground-glass towards one another and holding them in such positions, as well as enabling the ground-glass to be replaced very exactly by a sensitive plate held in a dark-slide. The various adjustments are necessary, because to have the lens fixed "pointing straight" at the centre of the plate, as in a magazine hand-camera, does not suit every subject. A cap or a shutter is for the purpose of admitting light through the lens to the plate for a definite time.

All these things may seem so obvious when put into words that the reader will perhaps wonder why I waste space on them.

Yet it is essential that the fact be grasped clearly that it is the lens that does all the "work." The "movements" merely permit one to take advantage of, or control, its various properties or peculiarities.

Before examining how they do this, the suggestions I mentioned as desirable are that the ground-glass should be smeared over with a trace of vaseline, which is then rubbed off again as much as possible. This allows the "image" to be seen more brightly. Next that a small (but not too small) spirit-level be obtained as well as a set-square, or any piece of flat stiff material cut accurately to a right angle. The remaining need is for a focussing-cloth. This is to wrap round the back of the camera and the observer's head, so that light is excluded and the image on the ground-glass clearly observed. Its essential points are that it must be opaque, not too heavy, and ample in size. These qualities are best filled by a double thickness of black "sateen" a yard square. Two yards of this material, folded once and the edges hemmed, make an ideal focussing-cloth. With these points and needs made clear we are in a position to examine and study any camera with ease in all its details.

Camera Parts and their Movements.

When the reader sees by the list below what a great variety of adjustments there are that may control the respective positions of the lens and ground-glass, he will realise why I emphasised by a whole preliminary paragraph what they are really for, before plunging him into detailed explanations of each movement. Every stand-camera has some of these movements; few, if any, have them all.

The four main portions of the camera are.—The *front*, carrying the lens; the *back*, with ground-glass and grooves for replacing this by a plate held in a dark-slide; the *bellows*, which connect the first two and keep all outside light from penetrating, while allowing the parts to move freely; the *base-board*, which acts as a support for the other parts and may itself be fastened upon a tripod or other stand. When set up in a normal position both the front and the back should be at right angles—both vertically and horizontally—with the base-board, and therefore quite parallel with one another. This is easily tested with the set-square, and if the camera as bought is found not true in this respect marks should be made so that the parts can be set up correctly and fixed so at any time subsequently. Taking each of the parts separately the list of useful movements is as follows:—

FRONT.

Rising (and Falling) Front.—Sliding up and down.

Cross Front.—Sliding sideways.

Swing Front.—Pointing lens up and down.

Side Swing.—Pointing lens to one side or the other. (This movement is rarely provided on a camera, but can generally be improvised when required.)

BACK.

Reversing Back.—Allows ground-glass to be placed "upright" or "across." The former is mostly used for portraits, and the latter for landscapes, and is often termed "landscape-way" of the plate.

Swing Back.—Swinging towards or away from the front, pivoted either centrally or at the bottom.

Side Swing.—Same remarks as side swing on front, but is usually found on studio cameras, and on many fixed cameras.

BASE-BOARD.

Adjustable Extension.—Sliding movement to allow of varying the distance between the front and the back. This may be a single slide either of the front or the back.

Preferably the camera should have a "double-extension," i.e., an inner frame sliding forward and carrying the front with it on turning the milled knob of a "rack-and-pinion." This allows the lens to be carried further from the plate than a single-extension camera, which latter is very limited in scope. A "triple-extension" allowing of still longer distance between front and back is still more useful, provided that the camera is not so flimsy as to wobble or sag when extended.

Turn-table.—This is a revolving metal ring to which the legs of a tripod are attachable. If this is not present there should be a screwed "bush" for attaching to an ordinary tripod top by means of a screw.

BELLOWS.

These have no special adjustments, being flexible, but in long-extension cameras it is usual for there to be rings attached to folds near the middle for supporting the weight of the bellows at short extensions, and so prevent sagging into the path of the light from lens to plate.

Lens and Diaphragm.

The lens itself has one moving part that should be explained before going into the adjustments of the camera body because it does more to affect the image than almost any other item, and the other movements are always considered in conjunction with this one. That is to say, the other adjustments will either help or hinder the work of this essential one. The part referred to is the "diaphragm" of the lens, a device for making the aperture of the tube larger or smaller. It may be a wheel with holes of various sizes or a set of plates also with different sized holes to slip into a slot, but most lenses nowadays have a built-in "iris diaphragm" which opens and closes on turning a ring or pointer.

Let the camera be set up with front and back "normal," *i.e.*, at right angles to the base and the lens as central as possible with the plate, opening the lens diaphragm or "stop" as far as it will go, and pointing it towards some brightly lit objects. On moving the lens or the back to and fro while the observer's head is under the focussing-cloth an image will be seen on the ground-glass more or less distinctly. Here let me warn the beginner to keep his head well back and to look *at, not through*, the ground-glass. The sliding to and fro is called focussing, because one brings to a focus, or sharp point, the image on the ground-glass of part of the subject seen. All the subject will not become sharp at one time, because parts which are at different distances require different lengths of extension between lens and plate. The further away the object the shorter the extension required. Beyond a certain distance all things seem sharp without altering the focus, but with comparatively near objects a great deal of movement is required between the points at which the camera gives one object sharp or another. Although this is elementary, I should like to ask the reader to carry out a sort of practical exercise at each stage, even if only to satisfy himself that what I say is true. Reading alone will not fix things in the mind, and I want to get the elementary points well home so as to make it easier for the student to get hold of things that may seem a bit more complicated and not so obvious later on.

When the "focussing practice," as perhaps I may be allowed to call it, has been tried on several different subjects, distant, near, and near and distant combined; when the sort of images produced by these with the lens at "open aperture" have been observed and carefully compared, as well as the various lengths of extension, preferably by means of actual measuring, let one of the "near-and-distant" subjects be focussed on a point about a third of the distance back from the nearest principal object to the furthest one. Then while looking at the image close down the lens aperture, and it will be seen at once how other objects besides the one most sharply focussed become sharp also. At the same time the image becomes much dimmer all over because less light is allowed through. Therefore in exposing a plate more exposure is needed to make up for the weaker light.

This simple example is put forward not only for the knowledge of the direct effects of "stopping down," as reducing the size of hole is termed, but to show that photography is all through a matter of compromises. As a rule you cannot have a large aperture for short exposures and sharpness of varying distances at the same time. The latter quality is called "depth of focus," and is increased by using a smaller aperture.

The meaning of the numbers of the apertures will be explained later, as they are for use in estimating exposures. Any want of sharpness in the image, due either to the lens itself, or to the use of the various movements of the camera being brought into play can be partly or wholly overcome by stopping down. Sometimes these movements are used to prevent the need for using small stops, where short exposures are essential. These will be taken one by one and explained fully in subsequent articles.

D. CHARLES.

PRACTICUS IN THE STUDIO.

[Previous articles of this series, in which the aim of the writer is to communicate items of a long experience in studio portraiture, have appeared weekly since the beginning of the present year. It is not thought possible to continue the series to the length of that by the same writer which ran through the "British Journal" some years ago, but if any reader among the younger generation of photographers, and particularly those engaged as assistants, has a particular subject which might be dealt with, his or her suggestion will be welcomed. The subjects of the previous articles of the series have been as follows:—

A Talk About Lighting (Jan. 3).
The Camera and the Lens (Jan. 10).
Managing the Sitter (Jan. 17).
Backgrounds (Jan. 24).
Studio Exposures (Jan. 31).
Artificial Lighting (Feb. 7).
Printing Processes for Portraiture (Feb. 14).
Studio Accessories and Furniture (Feb. 21).
The Surroundings of the Studio (Feb. 28).
Studio Heating and Ventilation (March 7).
The Postcard Studio (March 14).
The Printing-Room (March 21).
About the Reception Room (March 28).
Home Portraiture (April 4).
Portable Studios (April 11).
Copying (April 18).
Handling the Studio Camera (April 25).
More About Lenses (May 2).
Enlargements (May 9).
Advertising the Studio (May 16).
Mounts and Mounting (May 23).
Business Methods (May 30).
Photographing Children (June 6).

PORTRAITS OF ELDERLY PEOPLE.

It is bad form now to talk of old people, so that I have gone as far as I dare, and only describe the class of sitters I deal with this week as elderly, and with these I do not class the lady immortalised by W. S. Gilbert, who "might very well pass for forty-three in the dusk with the light behind her." People who have left the fifties behind may still possess a large reserve of strength and activity, but unless artificial aids are freely made use of carry their age in their faces, and present a different set of problems to the photographer from those which he meets with when photographing those who are still youthful or in what is commonly called the prime of life. Fortunately, most are conscious that they are no longer young, and do not demand the same class of picture as they would have done at an earlier stage in their lives, so that the photographer is at liberty to deal with them so as to produce a good portrait rather than to endeavour to make a "pretty picture," and as nearly all have more or less picturesqueness or dignity this should not be difficult.

One of the greatest errors that can be made is to endeavour to obliterate the traces of time and to produce a picture which is neither like the sitter is nor was at any previous stage in his life; but, on the other hand, the photographer must make the best use of his opportunities, and not make the evidences of age more apparent than he can help.

The first difficulty to be met with is, of course, the colour and texture of the skin, and under this heading I include wrinkles. It is a good plan to start with the determination to leave as little as possible to be done by the retoucher, securing, by judicious lighting, appropriate lenses, and colour-sensitive plates, a negative which should be almost satisfactory without any handwork upon it. Most elderly folk have more character in their faces than young ones have, and therefore we may start with a softer, more diffused light, without danger of sacrificing the necessary relief. Although I do not, as a rule, care for dividing the light into two parts, with this class of sitter it is sometimes advisable to do so, using a good deal of rather low front light to illuminate the wrinkles, and then admitting a small amount of top light nearer the sitter to give the necessary modelling. This lighting will also be helpful in the case of deeply set eyes and hollow cheeks. When using artificial light the best results can often be obtained by using only reflected light or a combination of reflected and direct light, such as is provided by the enclosed arc and Jobson reflector. What we have to avoid is the production of a "railway map" effect which has to be retouched out of all knowledge before it is at all acceptable. There are some old people with faces of the "Pickwick" type who can be photographed without special treatment, but they form a small minority and do not make nearly such interesting portraits as those with features of a more rugged type.

Next in importance to lighting comes the quality of definition given by the lens. There are many lenses which would have been pronounced "bad" a few years ago which are excellent for our special purpose, for they are incapable of giving sharp definition, and take the edge off the lines and wrinkles in a very satisfactory way. It has in my time been my fate to be photographed by many of my friends with almost every type of lens, from the Bergheim to the most carefully corrected anastigmats, and I must say that I much prefer the "soft focus" results, provided that they are not too soft. The avowedly soft-focus lenses, such as the Bergheim and the Portland, tend to give too much diffusion in small sizes to be pleasing to most people, and I therefore recommend the use of a portrait lens such as the Dallmeyer, Cooke, or the more recent models of Ross as being most suitable for general use. With these any desired amount of diffusion can be obtained by increasing the separation as directed by the makers, but I would recommend anyone starting to use one to make a few trial exposures, noting on each the degree of unscrewing which has been done. It is not easy for one accustomed to sharp images to judge the printing quality of the diffusion by looking at the image on the ground glass, but if we have a set of negatives marked half-turn, one, two, or three turns, we can adjust our lens to one of these focus

as sharply as possible, and make sure of our result. If such a lens is not to hand, a very good substitute may be found in the front combination of an ordinary Petzval portrait lens, which gives a very pleasing softness, obtainable in two degrees according to the position in which it is used—that is to say, that if used with the convex side turned to the sitter a less degree of diffusion will be obtained than if it is turned round so that the flat side faces the sitter, but this is not a discourse on soft-focus lenses, and I must pass on to other points, prominent among which comes the question of the colour of the skin.

From various causes most people lose the pink and white of youth at a comparatively early age, and by forty the majority have taken on rather a non-actinic tint. This, of course, tends to accentuate the depth of the shadows and to make it difficult to illuminate the face properly. Moreover, in healthy subjects there is often a mottling of the skin with little red veins and patches, which, while not unpleasing to the eye, give a very rough and uneven effect in the negative when ordinary plates are used. For this reason I strongly advocate the use of orthochromatic plates in conjunction with a yellow filter, which reduces the colour contrasts to a minimum. Even better results may be obtained by using panchromatic plates with a K2 filter, which practically eliminates all the rough effect caused by red veins and yellow patches on the skin, and give images which hardly need any retouching except to modify the features or to correct the outlines; they also give an excellent rendering of faded blue or grey eyes, which usually appear as too light in the print. I have used the red filter of a trichrome set, but this gives an over-correction, and by practically eliminating all colour contrasts in the face gives an almost marble-like rendering. It may be feared that the exposures may be unduly prolonged by using a filter, but this is not so serious an objection as might be anticipated. Granted that a filter will require double the exposure being given, this can be overcome by using a larger stop and being more careful in focussing. Moreover, elderly people are usually good sitters, and will generally stand double the exposure usually given without moving, especially as the poses are almost always sitting ones.

Bald heads and white hair call for a word or two. Both need a little local shading, and for this a small head screen is useful, care being taken to place it so as to cut the light off the top of the head only, without interfering with the lighting of the features. The screen should be very thin—fine lawn being the best material, and this should be quite clean, so as to obstruct the minimum of light.

Spectacles are sometimes troublesome, and often preclude the choice of poses, but reflections must be avoided, as no matter how skilfully the eye is spotted-in, the effect is never quite natural. I would caution anyone against adopting the old dodge of using empty frames instead of retaining the ordinary glasses. Most spectacles either magnify or diminish the size of the eye, and friends become accustomed to this appearance. When the glasses are absent the effect is altered, and, in addition, the loss of them causes a strained expression, as the sitter can no longer see clearly. If the lighting can be managed without using a reflector, the risk of getting reflections in the glasses is minimised.

I have already mentioned the desirability of reducing retouching to a minimum, and this must be judiciously applied, the all-over style of working being very objectionable. The pencil should only be used to soften lines and spots, not to obliterate them. In many cases, especially with large heads, a piece of celluloid or even a very thin glass placed between the film side of the negative and the paper when printing will give a pleasing softness which takes the sharp edge off the definition, and saves much work.

Many of the most successful portraits of old people are those made "at home." The sitter is spared the effort of visiting the studio, and generally is in a more comfortable frame of mind among their usual surroundings. With the rapid plates now obtainable quite short exposures may be given in an ordinary room, especially when a good *f*/4.5 lens is used. Going out in this way means extra time and work, but I do not believe in making any considerable additional charge for it, providing that a decent order is given. Very often in such cases it is the last, if not the only, portrait the sitter has had taken, and re-orders, some perhaps for enlargements, miniatures, and the like, will probably come in, so that nothing should be done to discourage such business if the opportunity of doing it is offered. PRACTICUS.

COLOUR VALUES IN MONOCHROME, AND A NEW VIEWING FILTER TO ASSIST IN OBTAINING THEM.

[The following paper, read by Mr. F. F. Renwick before the Royal Photographic Society, deals with a problem which is always present in the translation of colours into monochrome. The author's exposition of recent research will help to make clear the complex nature of the problem and the orthochromatic writer will welcome the promise of more definitive methods which is contained in the latter portion of the paper.—EDS. "B.J."]

MY object in the present communication is to invite your attention to the bearing of certain researches on colour-vision upon the problems which confront both artists and photographers when attempting to translate the colours of a scene correctly into monochrome. It is, of course, impossible to convey any impression corresponding to the colours or hues themselves by mere variations in depth of tone in monochrome; our endeavours must, therefore, be limited to the rendering of the brightness or luminosities of these hues in their correct relative relationships.

The average person's judgment of the correct sequence of the luminosities of a number of different colours is so untrained that usually it is only the most obvious falsities of rendering in an ordinary photograph which cause comment. The majority of us are unfortunately too easily satisfied in this matter. Most artists, however, possess a very keen appreciation of colour values, which enables them to agree, with but slight divergencies, upon the relative tone values of any coloured scene. This faculty, which is largely the result of trained observation, is really common to most of us, and only requires educating.

If photographers are to deserve the commendation of our best artists for the truthfulness of their monochrome renderings of colour, something superior to the unconsidered use of a colour-sensitive plate and a yellow filter will be necessary.

The subject naturally divides itself into two parts: on the one hand we require to know something of the peculiarities of human colour-vision, while the colour-sensitiveness of photographic plates and the proper use of correcting filters constitute the other part.

I shall assume that everyone knows that the brightness or luminosity of a colour is no criterion of its power in other ways (its effect on a photographic plate, for instance). The only reliable means we possess of comparing and measuring the powers of differently coloured lights is to convert them by absorption completely into heat and measure their heating effects, as may be done, for instance, by means of a thermopile and sensitive galvanometer.

When such measurements are made it is found that there is no simple connection between the *powers* and the apparent brightnesses of two different colours, a conclusion which will not surprise any photographer.

Moreover, as everyone is aware, the appreciation of colour is a somewhat variable faculty. Some unfortunate people are quite blind to certain colours, many have slightly defective colour-vision, and in the light of recent work it is not too much to say that it would be surprising to find in an assembly of twenty or thirty people more than half-a-dozen in whom colour-vision was truly identical.

Apart, however, from these differences between individuals, the eyes of one and the same observer vary in colour-sensitiveness according to the manner in which he uses them.

If a bright multi-coloured object be examined from a distance of 10 or 12 ft., and a careful estimate is made of the sequence of luminosities it displays, and it is then studied anew at a distance of only 12 to 15 ins., it will usually be found that the sequence is no longer the same, especially in regard to the position in the scale of the blues which, to most people, become markedly brighter as the object is brought near.

In consequence of this complex character of our colour sensations much time has had to be devoted to the examination of a large number of persons before arriving at the characteristics of average or so-called normal vision.

It would take too long to discuss in any detail the structure of the eye, so I will content myself with stating that in the critical examination of a small or distant object the image formed by the lens falls on a very small area of the sensitive layer known as the retina. This small area is a tiny depression known as the fovea centralis, which is completely filled by the image of any object subtending an angle of 3 degrees. It lies at the centre of an oval area known as the macula lutea, or yellow spot, which is overlaid with a brownish-yellow pigment, and subtends an angle of about 6 degrees in its longest axis and 4 degrees in its shortest. In the ordinary direct but not critical examination of things we employ this larger area. (A cabinet photograph about 5 ft. distant would approximately fill the yellow spot.)

Outside this central region of clear vision lie those parts of the retina which receive the hazy impressions caused by outlying objects. The important fact to notice is that we form different impressions of the relative luminosities of a series of coloured objects according to the part of the retina on which the image falls, and it is therefore necessary first to decide on the particular mode of examining things which is to be regarded as normal before any more exact relations between colours and their tone values in monochrome can be agreed upon. It seems, however, obvious that since the macula lutea or yellow spot includes the whole region of clear vision within which careful comparison is possible without movement of the eye, it is the colour-sensitiveness of this area that we must take as our standard.

Now since the spectrum of white daylight includes light of every wave-length to which the eye is sensitive, it is clear that all visible colours may be regarded as white light *minus* one or more of its constituents; and since it has been experimentally proved that the luminosity of every colour is equal to the sum of the luminosities of its components, it follows that if we know the relative luminosities of all the colours of the spectrum of white light the relative luminosities of all other (compound) colours depend only on their spectral compositions. For us photographers the important conclusion follows that if we can make a combination of colour-sensitive photographic plate and correcting filter which will correctly record the relative luminosities of every component of the spectrum of daylight, then the same combination will be able correctly to record the tone values of all coloured objects.

Since there is no such thing as a standard of whiteness and our various light-sources differ considerably in the colour of the light they emit, from the bluish white of bright summer daylight to the yellowness of the paraffin flame, it will be evident that the relative luminosities of a range of colours varies widely with the kind of lighting employed, a fact with which you are no doubt familiar, so that a rendering in monochrome of a multi-coloured object can at best only be strictly correct for a given illumination. If, however, our combination of plate and filter records quite correctly all colour values by daylight, it must also record them correctly (though differently because they are different) by arc light or by any other illuminant.

Note.—Our eyes possess a certain power of accommodation by which we tend always to regard the prevailing illumination as our standard of whiteness and fail to appreciate the magnitude of the colour differences between one illuminant and another unless a direct comparison is possible. Whether this phenomenon, which constitutes a species of partial insensitiveness to the dominant hue of the prevailing illumination, also affects, to any appreciable extent, our judgment in determining the relative luminosities of differently coloured objects, I have not yet been able to establish. If so, and it seems likely, then it would not be possible to devise a combination of plate and filter which will give equally true records for a wide range of illuminants.

We will now glance at the results obtained by scientific workers concerning this problem of the relative visibility of the different regions of the spectrum.

Since the early work of A. Koenig, Sir William Abney and Professor W. Watson have done a great deal of work on colour-vision in this country (Abney's book, "Researches in Colour Vision," Longmans and Co., is a valuable summary of most of their work), while very exhaustive researches have been undertaken in recent years in America by H. E. Ives, P. G. Nutting, and others.

See particularly H. E. Ives, "Phil. Mag.," December, 1912, p. 853; W. Watson, "Proc. Roy. Soc.," 88A, 1913, p. 404; P. G. Nutting, "Trans. Amer. Ill. Eng. Soc.," IX., 1914, p. 633, XI., 1916, p. 1; Hyde and Forsythe, "Phys. Rev.," July, 1915, p. 70; Troland, "Trans. Amer. Ill. Eng. Soc.," XI., 1916, p. 956; Coblentz and Emerson, U.S. Bur. of Standards Sci., Paper 303; I. G. Priest, "Phys. Rev.," Vol. XI., p. 498, June, 1918.

The final conclusion reached as the result of all this work is that for bright illuminations the retina of the normal eye in the region of clear vision is most sensitive to light of frequency 541 × 10^{12} vibrations per second (equivalent to wave-lengths 555$\mu\mu$), the

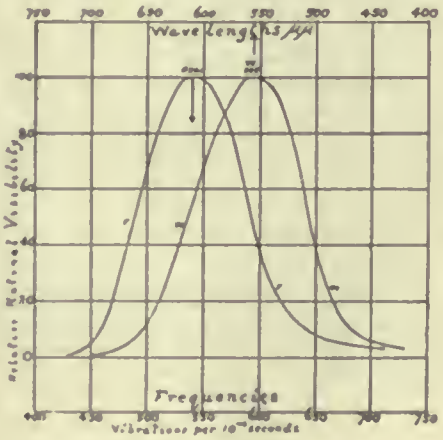


Fig. 1.

sensitiveness falling off symmetrically on either side of this frequency in accordance with the following empirical equation:—

$$V = e^{-0.0002664\,(f-541)^2},$$

where V is the ratio of visibility at frequency f to the maximum visibility at frequency 541 (I. G. Priest, "Phys. Rev.," XI., p. 498, June, 1918) (see Fig. 1). This result refers, however, to the retinal layer itself, after allowance has been made for the selective absorption of the yellow pigment and other media overlying it, and also it refers to light of equal power throughout the spectrum. Owing, however, to the presence of the yellow pigment and the other absorbing media through which the light reaches the retina, the curve of visibility no longer remains quite symmetrical when we are dealing with the natural eye, the luminosity at the blue end of the spectrum being a little depressed by their selective absorption. Moreover, average noonday sunlight at the earth's surface does not possess equal power throughout the spectrum, the intensity at the blue violet end varying for the same time of day about 30 to 40 per cent. owing to changes of atmospheric conditions (see I. G. Priest,

"Phys. Rev." II., p. 502, June, 1918).[1] Nevertheless, it remains substantially true that the relative luminosities throughout the spectrum of average daylight can be fairly represented by a symmetrical curve rather like a round-topped spurwheel tooth in shape with its maximum at wave-length 555$\mu\mu$ in the green. Further, it remains fairly true for many other sources of white light which give a continuous spectrum (open arc, tungsten filament lamps, etc.) if we ignore the invisible ultra-violet region, except that the position of the maximum is somewhat shifted towards the red in these cases.

Turning now to the photographic aspect of the subject, let me first remind you that colour-sensitive plates are required for two very different classes of work.

In the one the records are obtained through filters (usually three), each of which allows only a sharply defined section of the spectrum to operate, the final object being to imitate the actual colours of the original by the aid of combinations of coloured pigments or stained

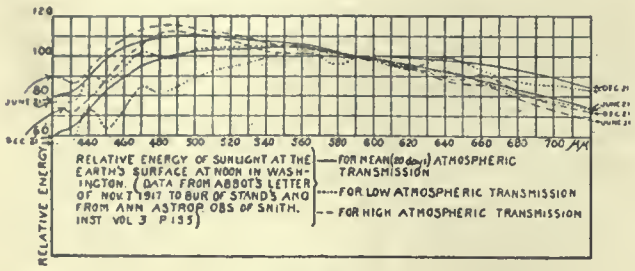


Fig. 2.

films. In the other class of work the aim is to procure a faithful record of the tone values of all colours in monochrome.

In the former class of photography our theoretical needs would be best satisfied by a panchromatic plate which accurately recorded the relative powers of the coloured lights acting. One which is equally sensitive to all visible parts of the spectrum of average daylight would approximate closely to this ideal. In practice, owing to the lack of transparency of all blue and green dyes (used as filters), the greater sensitiveness to blue and violet of even the best panchromatic plates is an advantage rather than otherwise. For the latter purpose, however, we should desire a panchromatic plate which required no correcting filter to enable it to record the relative luminosities of all colours as seen by the eye. Such a plate would have to possess a very strong maximum of sensitiveness in the green, falling off steadily on either side, in accordance with the luminosity curve we have already considered, towards the blue and red ends of the spectrum of average daylight. At present it is not possible to produce a plate of this kind, and we are therefore compelled to use correcting filters to hold back the blue and, to a lesser degree, the red, in order to attain our object. Unfortunately, it has become the practice to advertise colour-sensitive plates in very extravagant terms, and it is to be feared that many users of them are under the impression that one or other brand of plate of this class will give correct colour values in monochrome without the use of a filter, or at most with a pale yellow filter. In actual fact, manufacturers have not yet attained uniform sensitiveness to the whole visible spectrum of daylight, and we have already seen how much more colour-sensitive than this they must be to meet the requirements of correct monochrome rendering of all colours.

In working out practically the characteristics required in a correcting filter for the best monochrome renderings of colour, it was deemed undesirable to employ daylight owing to its uncertainty in colour from hour to hour and day to day; I therefore turned for assistance to the older data published by Sir William Abney on the luminosity of the spectrum of open arc light.

Sir William Abney made several very elaborate series of measurements of the relative luminosities of the different regions of the spectrum, using, as the source of white light, the crater of the positive pole of the open arc between pure carbon poles. The difference between this and summer daylight is, of course, appreciable, but is, I think, not sufficient to introduce any error in arriving at the quality of the correcting filter required for any given plate; for if we can work out the exact character of filter required to render correctly the relative luminosities prevailing in the arc-light spectrum, the same filter should also respond accurately to the relative luminosities in any other white-light continuous spectrum, including daylight, except at the far violet and ultra-violet end, which, however, it is best to cut out altogether in every correcting filter. I have therefore made use in what follows of results given or referred to in Abney's book, "Researches in Colour Vision." Abney's measurements all refer to the luminosities of narrow sections of the spectrum which were isolated by means of a slit of constant width = 1-25th inch (about half the interval between two of his scale numbers) caused to pass along it, and since it was a prismatic and not a normal spectrum we must make the necessary allowance for this fact.[2]

F. F. Renwick.

(To be continued.)

[1] See Fig. 2. The interesting series of curves reproduced herewith are borrowed from Priest's paper, and bring out clearly the remarkable changes in the spectrum of daylight brought about by varying atmospheric conditions. In each case the ordinates are referred to the prevailing intensity at or near the D lines λ 589 taken as standard = 100.

[2] Abney gives on page 246 of his book several curves and a table relating to the luminosities of a normal spectrum, but no explanation of the method by which these were derived from his observations. From a passage in one of his original papers (*Phil. Trans. Roy. Soc.*, 1886, p. 456) it appears, however, that he multiplied the observed luminosity values by factors inversely proportional to the 2nd or 3rd power of the wave-length to arrive at what he calls "a very approximate curve" for a normal spectrum, but no further details are given.

EXAMINATION QUESTIONS IN PHOTOGRAPHY.

[At the City and Guilds examinations held last month, candidates presented themselves only in Grade I. of Pure Photography and of Photo-Mechanical Processes. We print below the questions set in this grade of examination in Section A, Pure Photography, and have appended to each question an answer such as a student in this grade might reasonably be expected to give. The questions and answers set in Grade I. of Photo-Mechanical Processes will appear in a subsequent issue.—Eds. "B.J."]

PHOTOGRAPHY.

Grade I.

1. Describe any form of view-meter. State how it can be made to give accurate results, and describe exactly how it is used. (40 marks.)

A very simple form of view-meter, and one which is accurate for subjects at a reasonable distance from the camera, consists of a wire frame and a sight in the form of a small hole or an upright rod placed centrally behind the frame at a distance which should be the focal length of the lens if the frame is the same size as the plate. If the sight is fixed on the back of the camera and the wire frame on the front, the finder will automatically adjust itself to allow for the slight extension of the camera beyond the focal length of the lens. The only error, apart from error of use, will then be that due to the difference of view-point between the finder and the lens. This will be very small in the case of ordinary views, but may be appreciable in the case of near objects. By making the frame, say, half the dimensions of the plate, the distance between the frame and the

sight may likewise be halved, and the finder thus made more compact; also the finder may be provided with a base bar marked so as to allow it to be used with lenses of different focal lengths on a given size of plate. For example, if the wire frame is half the dimensions of the plate, the bar of the finder will be marked with distances such as 3, 4, 5 ins. (from one end or the other) for use with lenses of 6, 8, and 10 ins. focal length.

2. Under what circumstances is a rising front to the camera needed (*a*) in landscape work? (*b*) in portraiture? What is the effect of using it? (30.)

(*a*) In landscape work the rising front is used in order to avoid tilting the camera when it is necessary to include tall parts of the subject in the photograph or to cut off a great expanse of foreground. Apart from the effect of bringing within the space of the plate objects which otherwise would be cut off by the upper edge of the photograph (lower edge of the plate when in the camera), the only other effect of using the rising front may be want of definition in the negative in the upper part of the subject if the lens has not sufficient covering power. (*b*) In portraiture there is very seldom any occasion to use the rising front, since usually the whole camera can be raised or lowered within the limits required for different classes of portrait in the studio. Also with an ordinary portrait lens there is not enough margin of covering power to allow of the lens being displaced from a central position in respect to the plate without loss of definition being evident.

3. If a half-plate camera gives a maximum distance of 12 ins. from back to front, and it is desired to photograph a small object so that the picture of it is three times the diameter of the object, what is the maximum focal length of the lens that will serve? Explain clearly how you arrive at your result. (30.)

In focussing the sharp image of an object so that the image is *n* times the linear dimension of the original, the distance from the lens to the image is *n* times the focal length of the lens plus one focal length. Therefore in the given case there will require to be four focal lengths within the camera extension. As this latter is 12 ins., the maximum focal length of lens which can be used is 3 ins.

4. What is the composition of the film of an ordinary gelatine dry-plate, and of an orthochromatic plate? (50.)

The coating on the glass of a dry-plate consists first of any substratum which may be applied in order to secure the adhesion of the emulsion film during development and subsequent operations. The emulsion film itself consists of gelatine containing in a finely divided state the silver compounds which are the sensitive components of the emulsion. In an ordinary dry-plate the chief compound is silver bromide, with sometimes a small proportion of silver iodide. In the case of an orthochromatic plate these compounds are incorporated with a minute quantity of dye added to the emulsion in order to render it more sensitive to green and red light. In the case of the so-called non-screen plates the emulsion film may be further dyed as a whole with yellow dye to serve the purpose of a light-filter.

5. Mention three developers, and describe how they differ from each other in their action. (30)

Taking as the three developers, pyro (pyrogallic acid), amidol, and hydroquinone, these differ as regards the substances to be used with them in order to make them practicable developers, as regards staining of the image or the film, and as regards facility of giving contrast, and they differ also in keeping qualities.

Pyro is best used with carbonate of soda as the alkali or accelerator; amidol forms a developer simply when mixed in solution with sulphite; while hydroquinone can be satisfactorily used with either carbonate of soda or caustic soda (or caustic potash) as the alkali.

Of the three, pyro produces an image which is more largely formed of stain than that given by amidol or hydroquinone; also, it is much more liable to stain the gelatine film as a whole, and for this reason requires to be made up in solution with considerable quantity of sulphite or metabisulphite. Amidol made up with the quantity of sulphite suitable to produce its developing powers is practically free from stain, as is also hydroquinone, except that at times it is liable, in case of prolonged action and especially at a low temperature, to give a strong yellow stain.

Pyro lends itself to giving strong or soft negatives, within a given period of development, according as more or less of it is used in the developer. A developer containing 4 grs. per ounce pyro quickly gives contrast, whilst developer containing only 1 to 2 grs. per ounce gives soft negatives in the same time of development. Amidol behaves somewhat similarly, though to a lesser extent, whilst hydroquinone, especially when used with caustic soda, tends to give negatives of great contrast.

As regards keeping qualities, pyro will keep only for a comparatively short time when made up with considerable quantity of sulphite; amidol should be used on the day it is made up; whilst hydroquinone will keep for a very much longer time than pyro.

6. Describe the difference of the treatment of P.O.P., gaslight paper, bromide paper, and platinotype paper in getting prints on them, and also any difference necessary in the storage and general care of them. (40.)

P.O.P. is printed by daylight or by strong artificial light, such as arc or mercury vapour under the negative until the picture is much darker than desired. The print is then washed in several changes of water and toned in a bath usually containing gold chloride and ammonium sulphocyanide, again washed in several changes, fixed in a hypo bath containing 2 to 3 ozs. of hypo per 20 ozs. of water, and finally well washed.

Gaslight and bromide papers, when exposed under the negative, give an invisible image, which is developed. Gaslight paper may be printed by weak daylight or strong artificial light, and can be developed in weak light, such as that of a room away from the window, and preferably in the shadow of a screen. Bromide paper (much more rapid) is printed by any ordinary artificial light. Both classes of paper are developed with non-staining developers, such as metol-hydroquinone, chiefly used for gaslight, and amidol, largely used for bromide. They are fixed in hypo solution and well washed.

Platinotype paper, when printed behind a negative, gives a semi-visible image of a greyish-blue colour on the yellow ground of the paper. Printing can be done by daylight, or, if by artificial light, best by mercury vapour. The print is "developed" on a bath of potassium oxalate, where the picture appears at once and is fully developed in a minute or two, and is then "fixed" by passing it in succession through three baths of weak hydrochloric acid, finally washing it in water for a short time.

Platinotype paper requires to be kept perfectly dry in a calcium chloride tube; the other papers, and particularly P.O.P., need to be kept reasonably dry and cool if they are to retain their qualities without deterioration for any great length of time.

7. Give the details of any method of lighting a model for portraiture, and describe the result of the method that you select. (30.)

Assuming that the source of light is an ordinary window, the first step would be to block out all light up to a height of at least 4 ft. by means of a dark curtain. If the light were very strong, the upper part should be covered with butter-muslin to diffuse it a little. A dark background is placed close up to one edge of the window frame, and the model placed in front of it at such a distance that the light comes more or less from behind the sitter. The head is now turned until the profile is illuminated almost as a line, while a little light comes across and gives a soft high-light on the cheek nearest the camera. A white reflector is placed so as to give a slight general illumination to the same side of the face, but should not cause any pronounced high-lights. The result would be a so-called "Rembrandt" portrait.

8. What are the following substances used for in photography: Mercuric chloride, sodium sulphite, hydroquinone, potassium ferricyanide, ferrous oxalate. (35.)

Mercuric chloride is chiefly used for intensification of negatives, a solution of it forming the bleaching bath, on removal from which negatives are darkened (intensified) by other solutions. It can also be used in making the mercuric iodide intensifier.

Sodium sulphite is chiefly used as a preservative of developers in

solution. It is also used in compounding hardening-fixing baths, which are composed of sulphite, hypo, and alum.

Hydroquinone is used as a developer, often in admixture with metol.

Potassium ferricyanide is used in making Farmer's reducer (mixture of ferricyanide and hypo) and in compounding the bleach for sulphide toning (mixture of ferricyanide and bromide). It is also used in making the sensitiser for ferro-prussiate paper (mixture of ferricyanide and ferric ammonium citrate).

Ferrous oxalate was formerly largely used as a developer for bromide papers, being usually compounded by mixing solutions of potassium oxalate and ferrous sulphate in suitable proportions.

9. Suppose that in adjusting the camera to photograph a bright landscape a small hole through the front of the camera is uncovered, what will be the effect on the resulting negative? (25.)

The effect will be different, according as the hole is of fair size, such as anything over an eighth of an inch in diameter, or simply of size such as a pinhole. In the former case the effect will chiefly be to fog the plate as a whole to a greater or lesser extent. If the whole is simply a pinhole and if the camera is being presented to a very brightly lighted scene a faint image, formed by the pinhole, may be produced on the plate. If the surface containing the hole is parallel to the plate this pinhole image will probably not be separately distinguishable from that formed by the lens, but if the hole is in a part of the camera at an angle a separate faint image (of a more or less different subject) may be formed. If the camera, with the hole uncovered but with the lens covered, be carried about so that the front is turned in different directions towards the sun or a bright sky the result will be to form a series of dark bands curving in all directions on the negative.

10. Why is the image on the ground glass upside down? Is it always so? (30.)

Since all image-forming rays proceeding from different parts of the subject photographed pass through the lens without alteration of direction other than that due to the lens acting like a prism, it follows that rays emanating from the highest parts of the subject arrive at the lowest part of the focussing screen, and those from the lower part at the upper portion of the focussing screen. This is always the case, except when an erect image on the focussing screen is produced by the use of a right-angle prism on the front of the lens, as when photographing a drawing or plan made horizontally or when a mirror is used inside the camera, as in the reflex camera.

11. Describe what takes place when a plate is fixed. Why is it desirable to leave a plate in the fixing bath longer than may appear to be necessary? (35.)

In fixing a plate, the silver bromide contained in the emulsion film is converted by the hypo into a compound of hypo and silver which is soluble in water.

The probable reason for fixing for a longer time than required for the disappearance of the white emulsion is that there are several compounds of silver and hypo, and of them the one containing a relatively small proportion of hypo is very slightly soluble in water. Therefore if the fixing of the plate is stopped at the stage when this compound still exists in the film, the negative may be found to retain the insoluble silver compound when afterwards washed. Moreover, this compound is one which is very readily decomposed, giving rise to brownish stain.

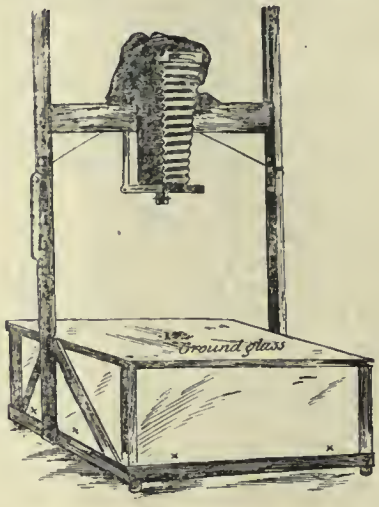
12. What method of intensification do you generally employ? Why does this method of intensification render the negative more dense? (40.)

The method usually employed is to bleach the negative in a solution of mercury bichloride (mercuric chloride). The solution is made by dissolving about 1 oz. of the bichloride in 20 ozs. of water. The negative is bleached through to the back and is then well washed for at least half an-hour, and then placed in a dish and a weak solution of ammonia flowed over.

The negative becomes denser owing to the fact that on bleaching in the mercury solution the silver image is converted into a compound consisting of mercurous chloride (calomel) and silver chloride. On treating with ammonia the mercurous chloride is converted into a very dark-coloured compound, in which some of the ammonia has combined with the mercurous chloride.

VERTICAL PHOTOGRAPHS OF SMALL ARTICLES.

In the course of a series of contributions on commercial photography to our Philadelphia contemporary, the "Bulletin of Photography," Mr. L. G. Rose describes the arrangement of vertical camera and semi-transparent easel employed for the photographing of such articles as small parts of a machine where it is required to obtain a print showing the articles against a white background, but without the labour of blocking-out on the negative. In order to dispense with this blocking-out, and at the same time to obtain more relief effect and better general illumination, owing to the removal of cast shadows, the goods are laid upon a ground-glass surface, below which are arranged a number of electric lamps. In the drawing the positions of the lamps within the enclosed space below the ground glass are denoted by × × ×. The series of electric lights is placed around the lower edge of the compartment, and reflectors shade the bulbs in such a way that the light is thrown on the white floor of the lower compartment, and is reflected up



through the ground-glass. The lights are turned on for a short time—say, for about 30 seconds—when they are switched off and the exposure carried on as usual. The light passing up through the ground-glass gives more roundness to the articles and an absolutely white background, providing too much exposure is not given with the lights on; over-exposure, of course, flattening it down to a gray tone. This method is used in the larger studios a great deal, as it does away with a lot of work and blocking, and at the same time gives a much nicer effect. If it can be afforded, an opal glass instead of the ground-glass is exceedingly fine. In such work as this, where the lens is faced by a comparatively strong light, an ordinary unbacked plate must not be used. Mr. Rose finds that film is quite satisfactory, or that a plate of the double-coated type, such as is made in America by several plate manufacturers (Seed, Cramer, and Hammer), is excellent.

SULPHIDE TONING MODIFICATIONS.

(From "Rajar Trade Notes.")

Some years ago in our "Trade Notes" we suggested a method of obtaining by the sulphide bath sepia tones which were colder than those usually produced on bromide and gaslight papers. The results having proved so satisfactory in our own work we are anxious that our new business friends should give their attention to the method. The only difference in procedure to the ordinary bleach and sulphiding is to first of all to place the black prints in a solution of sodium or ammonium sulphide, wash, bleach, and sulphide as usual.

For good sepia tones, without any trace of yellow, on gaslight prints this method is ideal. We also find that it produces very fine tones on the new "Rajo" paper, the colour being quite distinctive.

The fixed and washed prints are immersed in the following solution for five minutes:—

Liquid ammonia sulphide	1 oz.
Water	40 oz.

or in sodium sulphide 1 oz., water 40 ozs. Very little change takes place. In this bath a portion of the silver will have been converted into sulphide. The prints should be well washed and bleached in the usual manner, but it will be found that the image will not bleach out so completely as usual. When bleached and washed, the prints are placed in the sulphide bath, and washed as usual.

We prefer the ammonium sulphide in preference to the sodium salt, owing to its being more stable and not liable to erratic action.

Another method of securing fine tones is to bleach the prints in the usual ferricyanide-bromide solution and wash well. By now putting the prints into a weak developer (Amidol or M. Q. diluted with about five times its bulk of water) the black image reappears and gradually gains in strength. By carrying the development at this stage to a greater or lesser extent, tones from warm brown to brown black can be obtained. The prints are then rinsed, placed in the usual sulphide solution, and washed. The principle here is the blending of a black silver image with the usual sulphide-toned image; hence the variety of tones obtainable by controlling the degree to which the prints are developed after bleaching.

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Applications, May 26 to 31 :—

SENSITIZED PAPER.—N. 13,314. Photographic sensitized paper. D. Blount and A. Payne.

PLATE-CARRIERS.—No. 13,239. Plate-carriers for photographic dark-slides. W. E. Eldridge.

OPTICAL LANTERNS.—No. 13,212. Optical lantern arrangement. R. V. Pellerey.

CINEMATOGRAPHY.—No. 13,847. Cinematograph projectors. J. B. Barton.

CINEMATOGRAPHY.—No. 13,848. Cinematograph cameras. J. B. Barton.

CINEMATOGRAPHY.—No. 13,280. Separate leaf cinematographs. W. R. Booth and H. W. Hooper.

CINEMATOGRAPHY.—No. 13,432. Cinematographic apparatus, and operation thereof. W. S. Fitch.

CINEMATOGRAPHY.—No. 13,294. Cinematograph picture projection. J. E. Noake.

CINEMATOGRAPHY.—No. 13,250. Taking, printing and projecting animated pictures in natural colours. W. H. Speer.

CINEMATOGRAPHY.—No. 13,847. Cinematograph projectors. Sir O. Stoll.

CINEMATOGRAPHY.—No. 13,848. Cinematograph cameras. Sir O. Stoll.

COMPLETE SPECIFICATIONS ACCEPTED.

These specifications are obtainable, price 6d. each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

FOCAL-PLANE ROLL-FILM CAMERAS.—No. 125,615 (Sept. 12, 1916). The invention relates to photographic cameras fitted with roller-blind shutters and roll-films carriers in which the setting of the shutter and moving forward of the film after an exposure is effected simultaneously so that after each exposure one operation only is necessary before again exposing the film.

In such cameras the camera body is usually fitted with a roller-blind shutter, preferably self-capping, a roll-carrier removable and replaceable for removing one film and inserting another, and mechanism or gearing which by the turning of a single handle, lever or knob will move forward the film the desired distance for the next picture and simultaneously re-wind or set the roller-blind for the next exposure.

The invention consists in the combination of winding and setting gearing and a lever to arrest or control the movement of the setting handle, in the provision therein of a registering drum geared to the winding lever to indicate the number of film spaces which have been exposed, and in the particular construction of mechanism hereinafter described.

The roller-blind shutter is of well-known construction of the self-capping type, comprising blinds A and A^1 mounted on winding rollers a^1 a^2 at the bottom and spring actuated rollers a^3 and a^4 at the top, a pair of winding pinions B B^1, the pinion B gearing with the pinion b^1 and the pinion B^1 with the pinion b^2 on the ends of the rollers a^1 and a^2, a notched disc b attached to the pinion B^1 between the two pinions B and B^1, and a spring operated pawl a to engage the notch in the disc b to retain the pinions and rollers in the set position of the blinds when the blinds are wound upon the rollers a^1 a^2 and awaiting release.

The film spool-carrier (not shown) is also of the ordinary construction with flanges at its sides to retain the film rolls in position and rollers and a plate over which the film is passed.

The rotary spigot or stub axle C by which the film roll is rotated to wind thereon the length of film which has been exposed is provided with a spindle c to which one member c^1 of a one-way clutch may be affixed and by which it is rotated, the other member d of the clutch being affixed to the winding lever D. The member d of the clutch is preferably on the face of a pinion d^1 attached to the winding lever D, though they may be separate and both affixed to the lever D to rotate with it.

The pinion d^1 gears with a train of wheels d^2 d^3, and these in turn gear with the winding pinion B, and rotate it as the winding lever or handle D is rotated.

The winding pinion B is provided with a slot b^3 and the winding pinion B^1 with a pin e projecting through the slot in the pinion B. The winding pinion B^1 is out of contact with the pinion d^3 and is rotated by the back end of the slot b^3 when the wheel B has made part of a revolution.

The pinion d^1 is formed with the teeth only extending part way round the periphery the space without teeth allowing the pinion d^2 to rotate freely in the reverse direction when the shutter is released for an exposure. The size of the pinions d^1, B and B^1 in relation to the pinions b^1 b^2 on the rollers a^1 a^2 is such that one rotation of the pinion d^1 is sufficient to set the shutter for an exposure and move forward the film the desired distance for one picture.

A stop lever or catch E subject to the action of a spring e^2 is pivoted with one end over the winding pinions B B^1 in the path of the pin e and the other end is provided with two projections e^1 e^3 in the path of the winding lever or handle D with which a projection e^3 on the lever D engages. The projection e^1 on the lever E has a bevelled edge e^4 and prevents the rotation of the setting lever D at any time in a reverse direction beyond its normal or zero position, and the projection e^3 comes into position to prevent the rotation of the winding handle in a forward position after the shutter is set and before it has been released for an exposure.

The shutter is held set by the pawl a which is withdrawn to release the shutter for an exposure by a lever F and sliding bolt F^1 or other ordinary device. The bolt F may be operated by a knob f or by a pneumatic bulb, or by a wire or other ordinary or well-known device. Or a connection may be made with the winding lever D by which the release of the shutter will be effected on the completion of the winding and setting operation. For this purpose a peg or projection on the hand lever may depress a lever or catch connected with the shutter release lever.

An additional gear wheel g may be mounted on the spindle c of the film spigot C to operate, through a carrier wheel g^1, a registering or counting drum G with numerals on its periphery to indicate the number of film spaces which have been exposed.

A second winding knob may be applied to the sleeve c^2 on film roll spigot C to draw forward the film without operating the shutter to bring the film into position for exposure and to roll the end of it up after all the sensitised length has been

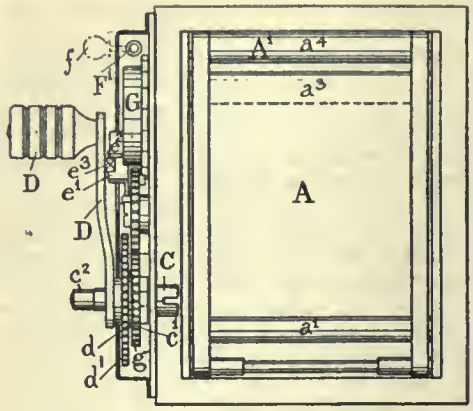


Fig. 1.

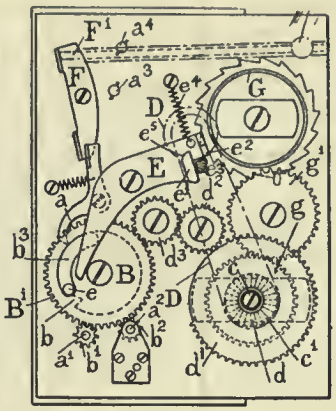


Fig. 2.

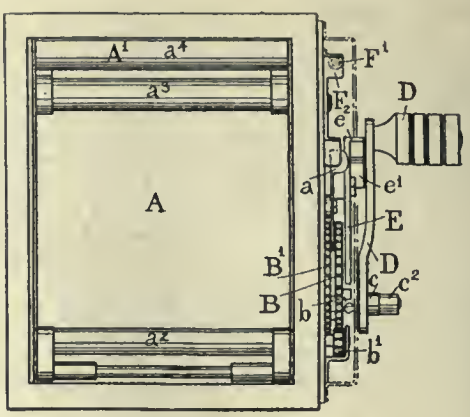


Fig. 3.

exposed. This, however, and the one-way clutch may if desired be dispensed with.

In operation after the film has been placed in position with its spool or roller in engagement with the stub axle C the winding lever D is rotated one revolution, this rotates the film roll spigot C, drawing forward a length of film into position and simultaneously rotates the gears d^1 d^2 d^3 and the winding pinion B to set the shutter for an exposure. The rotation of the winding pinion B rotates by the slot therein and pin e, the second winding pinion B^1 until the spring pawl *a* enters the notch in the disc *b* and holds the pinions B and B^1 in the set position. The pin *e* in the wheel B^1 moves the stop lever E until the projection e^2 is in the path of the projection e^3 on the lever D so as to arrest the rotation of the lever D when it has made a complete revolution, thus preventing overwinding of the film

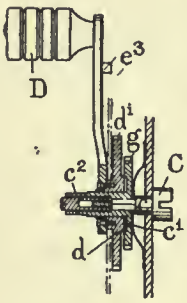


Fig. 4.

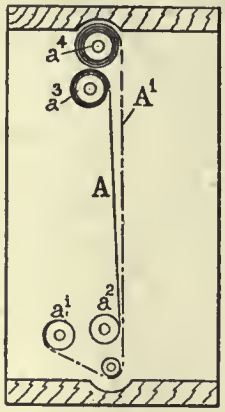


Fig. 5.

and over-setting of the shutter. The projection e^3 moves the lever E by pressing against the bevelled edge e^5 of the projection e^1, and after it has passed the spring e^4 restores the lever E to its previous position so that the projection e^3 is then caught between the two projections e^1 e^2 to prevent movement of the lever in either direction until the shutter has been released and an exposure taken. The reverse movement of the pin e allows the lever E to resume its normal position moving the projection e^3 out of the path of the projection e^2 on the lever D and permitting the lever D to be moved forward again to set the shutter for the next exposure, while at the same time the projection e^1 prevents movement in the wrong direction. The release is effected by a bulb or wire in the ordinary way, or by the rotation of the hand lever. The Thornton-Pickard Manufacturing Co., Ltd., Arthur Gray Pickard, and Frank Slinger, all of Altrincham, Cheshire.

FORTHCOMING EXHIBITIONS.

September 13 to October 11.—London Salon of Photography. Entries close September 2. Hon. sec., 5a, Pall Mall East, London, S.W.1.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

SATURDAY, JUNE 14.

Hackney Photographic Society. Outing to the Zoo.
South London Photographic Society. Excursion to Lincoln's Inn.
Huddersfield Naturalist and Photographic Society. Excursion to Sowood and Burkisland Hall.
Chelsea Photographic Society. Outing to Sudbury.

MONDAY, JUNE 16.

South London Photographic Society. "Carbon Demonstration." W. H. Howard.

TUESDAY, JUNE 17.

Hackney Photographic Society. Print Competition: "Illustration of a Quotation."
Manchester Amateur Photographic Society. Monthly meeting.

WEDNESDAY, JUNE 18.

North Middlesex Photographic Society. Portfolios. Lantern Slides. C. H. E. West.

THURSDAY, JUNE 19.

Hackney Photographic Society. Outing to Theydon Bois.
Hampshire House Photographic Society. "Orthochromatics." F. Bowen Williams.

ROYAL PHOTOGRAPHIC SOCIETY.

MEETING held Tuesday, June 3, the president, Dr. Atkin Swan, in the chair.

Major F. C. V. Laws, R.A.F., delivered a lecture entitled "Military Aeronautics from the Photographic Side." As one who has been connected with the aerial photographic work of the Army from its very outset, has filled various executive posts in connection with it during the period of the war and has taken a share in its enormous development, Major Laws found the description of the development of aerial cameras and of the organisation of the R.A.F. Photo Section an easy task, despite his protest that talking about the subject was out of his line. He traced the evolution of the different types of aerial camera and of the appliances designed for their use. A notable example of these was the anti-vibration frame constructed to hold the camera firmly yet to isolate it from the vibrations of the aerial machine. A short series of test photographs showed in a remarkable way the success of this device. The training of flying men for photographic work was illustrated by a series of official diagrams from which the airman could learn the effect of making exposures at too great or too small a height or of having the lens axis of the camera at an angle to the vertical. The lecturer showed a very large number of R.A.F. photographs, both vertical and oblique, taken in widely separated theatres of war.

The president, in proposing a vote of thanks to the lecturer, ruled that the audience should stand in giving it their affirmation. It says much for their docility that they did so. Taken by surprise, their reception of the vote was conspicuously feeble in comparison with what it would have been in the ordinary course.

Major Laws, thus confronted with what Mr. Wratten has called the "cathedral atmosphere" of the Royal, briefly responded, and added that the Photographic Section of the R.A.F. by no means imagined that its methods had reached perfection; the suggestions and inventions of photographers would receive full consideration.

CROYDON CAMERA CLUB.

An altogether capital evening brought the formal session to a close last week, Mr. A. Dordan-Pyke (late R.A.F.) giving a lantern-lecture on "The Importance of Photography in the War," or, to put it more definitely, that section represented by the wonderful record work of the R.A.F.

Upon the lecturer devolved the task of examining some thousands of applicants for the photographic section. A few elegant ones arrived in the full splendour of top-hats, frock coats and umbrellas, radiating an atmosphere of kindly patronage to all. Army men travelled miles to inspect and enjoy these specimens, who were eventually translated to a soil which afforded a change of costume and mind. One well-remembered applicant talked so grandiloquently about his wage earning capacity of £10 weekly that he nearly arrived at his goal by sheer verbal talent. Cross-examination, however, revealed he knew nothing about photography, the alleged stipend being paid him in his alleged capacity as a receptionist. (One never knew these were male beasts, but we live and learn). Needless to say the R.A.F. declined to act as receptionist to the applicant. At the start, Grade 1 men were not accepted for the photographic section, and although this mistake was soon rectified, many a skilled photographer had drifted into other ranks and could not be traced.

As showing the rise in production of photographic chemicals during the war, the firm with whom Mr. Pyke is associated, Messrs. Johnson and Sons, supplied 100 lbs. of metol in 1905; in 1918 this had risen to 2 tons, and 5 tons of various chemicals, etc., were supplied weekly in circumstances of great difficulty. Included was a special developer for X-ray negatives, over five and a quarter million negatives being developed by its aid. A local paper ascribed this feat to the lecturer, who seems to have suffered generally from being misreported.

Fully seventy-five per cent. of the negatives taken, he said, were on Wratten's panchromatics, a large proportion being on an "auto-screen" panchromatic issued by the Wratten Division of Messrs. Kodak. The speed, naturally, was considerably slowed, but this was found to be of no importance, and the results were excellent.

The many superb slides shown, nearly all taken from aeroplanes, clearly indicated the knowledge gained of the goings-on of the then superb elegant and now wailing Hun. The general staff invariably wanted prints in a little less than no time after the free-settings, and, occasionally, changing boxes full of exposed plates descended to earth attached to a parachute. Vivid photographs of bombs exploding on thoughtfully selected spots, torpedoed vessels sinking, submarines executing a last submersion, gun emplacements displaced, and the like aroused the keenest interest. Some slides illustrated the exquisite defining power of the Ross Xpres lens.

It should be mentioned that two young ladies accompanied Mr. Pyke, and introduced a refining element almost unknown in the club, if rare "ladies' nights" be excepted. He made it quite clear that the unexpected pleasure was entirely due to their intense interest in the *lecture*. At the suggestion of the "office boy" a most cordial vote of thanks was accorded the trio.

In the secretary's boldest texting, the club's notice board contains the following disturbing announcement:—

ORDER TEA TICKETS BEFORE 16TH JUNE, OR STARVE.

Presumably this refers to the Affiliation outing up the Wandle which is now hardly at its best, but is still navigable for tadpoles of spare habit. The route fairly abounds with unprobabilities for picture making.

EDINBURGH SOCIETY OF PROFESSIONAL PHOTOGRAPHERS.

The eighth meeting of the session took place on Monday, June 2, Mr. E. D. Young in the chair. The chairman introduced Mr. Robert Burns, A.R.S.A., who had come to give the society a further talk on pictorial composition. Mr. Burns referred briefly to some of his former remarks on the subject, and produced a number of photogravure reproductions of paintings by Sargent. These he placed one by one before the meeting, and illustrated the points in the composition of each by means of a blackboard, on which he drew roughly the "bones" of the composition. By this means he showed the importance of the chief lights and shadows of each picture; and, in order further to demonstrate his meaning, he removed or altered the position of some of the more important features, and by this alteration of the arrangement showed how easily the entire scheme could be thrown out, and consequently how important and necessary was each point in its particular place.

Sargent, the speaker explained, was, more than any other artist, akin to the photographer. His work did not depend so much on colour as on light and shade, character and likeness. A photographer should endeavour to obtain the likeness of his subject as he or she appeared under normal conditions. The friends of the subject were accustomed to see him or her under all sorts of lighting conditions; but to see the person at home under a lighting in which only a small part of the face was visible—the remainder being lost in shadow—was not a probable occurrence.

The first reproduction shown was that of the head of a man with face turned well toward the light, leaving only the right jaw and ear in shadow. This latter arrangement just prevented the face from being a mere geometrical figure. It was most important to avoid all similarity to geometrical figures in composition. The speaker reminded the meeting of his previous talk, when he had pointed out that in most cases good composition was found to be triangular; but, nevertheless, the triangle should not approach the equilateral form.

The next illustration was that of an old man, full-length, seated in a chair, with hands folded, of which the three main points were the face, the hands, and a light at the bottom of the picture slightly to the left. Mr. Burns pointed out how important was the fact that the two lower points were closer together than to the first point, and showed, by making the three equidistant, that these two then became of equal value with the head, and thus detracted from what was, of course, the proper centre of interest. A globe introduced in shadow to the right of the figure served to counteract the tendency to too straight a line in this composition. The introduction of such accessories in a photograph was discussed, and the difficulty was pointed out that such things were apt to insist more upon their presence than the photographer had thought or intended.

A skilfully-arranged group of three women was then shown. Here, it was pointed out, the heads were not equidistant, as they might easily have been, but were formed into a group of two, with the third slightly apart. The height of the heads, likewise, was not the same, but they formed a line approaching an inverted curve or modified U-shape. This line was a good one to use in such circumstances. A dog introduced at the left-hand bottom corner of the group—though perhaps not a very happy inclusion in this instance—was shown, nevertheless, to be absolutely necessary. In another group of three women, where one sat, and the others stood on either side, the same curved line of the three heads was evident; and a clever use of a sash was shown to obviate the too-close repetition of the one standing figure by the other. An alternating arrangement of a light dress against a dark portion of the background, and a black hat against a light part, also gave variety. Yet another group of three gave illustration of the fact that an ostensibly accidental upright line of light in the background may assist not only in the balancing of the picture, but help to carry the main line to completion.

In an upright full-length figure of a man, a walking-stick in the left hand served to balance a light in the diagonally opposite corner of the canvas; and, in another, a shadow in the lower half of the background served the purpose of shortening what would otherwise have seemed too tall a figure. A fine head being shown, the speaker paused to remark upon the skill with which this was placed upon the canvas. Mr. Young mentioned that most photographers were in the habit of placing the heads of their subjects lower in the picture than was customary among artists. Mr. Burns emphasised the necessity of avoiding anything approaching a "bull's-eye," caused by placing a head in the centre. The apparent height of a head could be greatly altered by the raising or lowering of an important object below it. An illustration of this was given.

A general discussion then took place, in which the difficulties of painted backgrounds were mentioned. It was felt that for the purposes of a background a long studio, one end of which was lost in shadow, would be a desirable one for a photographer. The meeting closed with a hearty vote of thanks to the speaker.

Commercial & Legal Intelligence.

NEW COMPANIES.

ENTWISTLE, THORPE AND CO., LTD.—This private company was registered May 28, with a capital of £2,000 in £1 shares (750 7 per cent. participating cumulative preferred). Objects: To take over the business of drawing-office material dealers, commercial photographers, photo-printers of plans and other documents, and photo-engravers, carried on by H. Entwistle and W. H. Thorpe, at 35, Great Peter Street, S.W. Permanent directors, H. Entwistle, 11, Redclyffe Road, Withington, Manchester, drawing-office stationer; W. H. Thorpe, 9, Harold Street, Middleton, Lancs., drawing-office stationer. Solicitors, F. Entwistle and Sons, 83-5, Long Street, Middleton.

News and Notes.

CELLULOID in sheets, rolls, and rods is in the list of articles restriction of the importation of which has been removed by the Board of Trade, after consideration of the recommendations of the Consultative Council on Imports.

THE LATE C. WELBORNE PIPER, among other bequests to relatives and friends, left the sum of £20 to the Croydon Camera Club "to do as they liked with." It is not difficult to imagine what the Croydon Camera Club will try to do with the money.

HIS MAJESTY THE KING, during his visit to Leicester on Tuesday last, visited the lens and optical factory of Messrs. Taylor, Taylor and Hobson, where he and the Queen inspected the processes in the manufacture of lenses. Mr. William Taylor, by whom the works were shown to the King, explained the methods adopted in the highly delicate figuring of the glass surfaces.

AERIAL PRESS PHOTOGRAPHS.—On the first day of the establishment of an aeroplane series of trips between Blackpool and Manchester, Mr. F. T. Curson, "Daily Sketch" photographer, was a passenger, and although the weather conditions were unfavourable, took a number of photographs, which were reproduced in the "Daily Sketch" and the "Daily Despatch."

MR. J. A. BALDWIN, proprietor of the Sunderland and West Hartlepool Studios of Hancock and Co., and formerly of the Photographic Section, Royal Air Force, is holding an exhibition at his Sunderland Studio, 312, High Street West, from June 17 to 27, of pictures taken by him in Mesopotamia. The exhibition will consist of about 240 sepia bromide enlargements of life and scenery in Mesopotamia. Mr. Baldwin will be very pleased to send a card of invitation to anyone interested who will apply to him.

DAGUERREOTYPES ON LOAN.—Mr. William Tylar, formerly of Birmingham, and now of Victoria Road, Ferndown, Dorset, informs us that he has a collection of fine specimens of the Daguerreotype process, of quarter-plate size, and in almost all cases representing persons of standing at the time the portraits were taken. He is prepared to lend a set of ten of these Daguerreotypes to any professional photographer who is anxious to use them for a window display. The charge is 7s. 6d., plus postage, for a week's hire.

FLASHLIGHT ACCIDENT.—A photographer of Raleigh, N.C., may suffer the loss of one eye and his left hand as a result of a bottle of flashlight powder exploding in his hand while he was attempting to take a flashlight picture in one of the departments at a tobacco factory. He was working with an electrical apparatus which was used for igniting the flashlight poweder. In attempting to pour some of the powder from a flask into the firing tray a short-circuit in the wiring caused a premature spark, which ignited the powder in both the tray and in the bottle.

BRITISH ASSOCIATION GEOLOGICAL PHOTOGRAPHS COMMITTEE.—The Secretary, Mr. S. H. Reynolds, The University, Bristol, writes:—Very few geological photographs have been received during the last few years for obvious reasons. The committee, however, hope that as the war may be considered to be at an end, a good series may now be contributed. In order that they may be incorporated in the forthcoming report, photographs should be sent to the secretary not later than the end of July. It is particularly desired that copies of all *published* geological photographs may be received.

THE AFFILIATION OUTING.—In the capable hands of Mr. J. M. Sellors, honorary secretary of the Croydon Camera Club, very complete arrangements have been made for the summer outing of affiliated societies to Croydon on Saturday, June 21. The district to which members of the party will be introduced is that from Waddon through Beddington, Carshalton, and Carshalton Park to Wallington. Arrangements have been made for the issue of a map by which members of the party can explore the photographic attractions of this district, along the route of which they are to go as and when they please, and will encounter members of the Croydon Camera Club for their guidance and information at certain points. Ticket for tea at 6 p.m. in the Christchurch Presbyterian Hall, Wallington, is also a ticket of special permission to photograph in the ancient buildings on the route, such as the Archbishop's Palace and the Whitgift Hospital. Medals for photographs taken on the outing are offered by the Croydon Camera Club, the United Stereoscopic Society, and by an anonymous donor. Complete particulars of railway and other arrangements are contained in the circular obtainable from Mr. Sellors, 27, King Street, Covent Garden, W.C.2.

LANCASHIRE SOCIETY OF MASTER PHOTOGRAPHERS.—At the annual general meeting, held at Blackpool on May 27, it was announced that the election of several new members has brought the total membership up to 140. Following the president's address and reports from the hon. treasurer and hon. secretary, the election of officers for the current year took place. The following officers were elected:—President, F. Kenworthy; hon. treasurer, F. Read; hon. secretary, W. H. Huish. Committee, J. P. Bramber. H. Baylis, W. P. Beck, W. T. Parker, G. Connard, C. Foley, R. H. Gresswell, H. Haigh, C. Howell, H. Melling, J. Saronie, J. W. Stott, A. Walmsley, J. Watson, and A. Winter. The address of the newly-elected secretary, Mr. Huish, is 39, Blackfriars Street, Manchester, where all communications for the Society should be sent.

The thanks of the Society were accorded to the photographers who had contributed examples of their work to the loan section of the exhibition held by the Society at Blackpool. These exhibitors were:—Messrs. Marcus Adams, J. E. Bacon and Sons, A. Basil, William Crooke, J. Donovan, F. H. Evans, W. Illingworth, Alex. Keighley, H. Lambert, R. M. Morgan, R. N. Speaight, J. B. B. Wellington, and Mr. and Mrs. Williams.

AMERICAN AERIAL PHOTOGRAPHY ASSOCIATION.—Nearly 4,000 photographers, both professionals and amateurs, were in the Photographic Branch of the Air Service during the war. An association of these has been formed and has recently sent out a plea for all men who were members of this branch to join and thus help preserve the friendships and objects of the Aerial Photographic Service.

Enlisted men at the Army School of Aerial Photography, at Rochester, took the initiative in this movement and formed the U.S. Army Aerial Photographers' Association last December. Honorary members include Lieut.-Col. John S Sullivan, Major James Barnes, Capt. M. A. MaKinney, Jr., Lieut. Wm. D. Wheeler, Capt. Harry A. Wilsdon, Lieut. Andre H. Callier, Mr. George Eastman, Mr. W. F. Folmer, and Dr. C. E. K. Mees, all names well known to the photo branch men. The president of the association is Henry Van Arsdale, Jr., 25, West Forty-fourth Street, New York City. Communications regarding membership, etc., should be sent to Carl Kattelmann, secretary-treasurer, 617, H Street, N.W., Washington, D.C., or to Wickham Harter, assistant secretary-treasurer, 636, East State Street, Trenton, N.J.

It is the intention of the association to obtain a large membership so that it will be possible to issue, at intervals, a publication dealing with matters of aerial photographic interest, to hold a large reunion in Rochester this summer, to conduct local reunions, furnish membership pins, and generally keep aerial photographic interest alive.

Correspondence.

. *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

. *We do not undertake responsibility for the opinions expressed by our correspondents.*

SOUTH AFRICA AND ASSISTANTS.

To the Editors.

Gentlemen,—At this juncture I think a word of advice to my fellow-assistants will be appreciated. I came out here about 14 years ago, and have seen the growth of photography during that time. My main purpose is to advise all assistants thinking of coming to South Africa to be careful just at present, and to see that a proper wage is paid for their services. There is a demand for good men here, but they should not make the mistake that I did in accepting a billet for a number of years at a ridiculous salary. At present living is extremely high, clothing and general necessaries of life are so highly priced that only those out here know what amount is required. A good all-round assistant who knows his work should not come out for less than £40 per month; this may seem a lot to some, but it is sufficient, and will enable one to save a little, not much. The climate is good, except in Durban or Bloemfontein, where it is frightfully hot in summer. Plenty of light clothing should be brought. Above all, the assistant who thinks of coming out here should be sure that his health will stand the climate, or he will be paying the doctor 10s. each visit. I send this advice because the agent who sent me out told me I could live on £5 per month and save heaps. I was sorely disappointed, but having signed the agreement I had no other choice. So, comrades, take care. We want good men who can earn good money.—Your well-meaning COMRADE.

Johannesburg, May 1.

ASSISTANTS' WAGES.

To the Editors.

Gentlemen,—I cannot quite agree with the remarks of your correspondent "An Assistant," writing in the "B.J." of May 30 p. 303. In the first place, I doubt very much if there are any employers about at present who would expect to engage a "thoroughly competent and capable man" for anything like £2 per week, unless it be for one whom he terms "war products." In the second place, I doubt if actual promises were made by any employers to keep places open for patriotic assistants, unless in a few rare and exceptional cases. A really capable and competent operator-retoucher can easily demand and get £5 per week and upwards. If your correspondent happens to be one of those unfortunate "two pounds a week," then by all means let him get in touch with me. If he is the right man I may be able to give him a useful hint or two.—Yours faithfully, AN EMPLOYER.

LANCASHIRE MASTER PHOTOGRAPHERS' EXHIBITION AT BLACKPOOL.

To the Editors.

Gentlemen,—On receiving my "B.J." last Friday I was rather anxious to see what was said in reference to the above, but I was not surprised to find that the remarks were about equal to the exhibition or the "Quiet Little Show" as it is termed. When I saw the exhibits in the small room I asked for the other part of the exhibition, but I was told it began and ended there.

Of course that accounted for no catalogues—it wasn't worth it. I imagined how it would have looked if there had been no mounts, frames or glass as intended at one period of the arrangements.

Amongst the master photographers' exhibits I was pleased to see some very fine work, and well worthy of copy in pose and execution; but for the gem of this section I should be a long way from agreeing with the writer of last Friday's article. On learning that the exhibits were to be judged by the secretary and members, I looked for the result in last week's Journal, but I did not see any mention of it. I have also made several enquiries, but I am no nearer knowing the result of voting.

Perhaps the secretary and committee will provide an exhibition next year that will be worthy of the name "Lancashire Master Photographers," and show what the men of Lancashire can do! Yours faithfully, "HOPEFUL."

Answers to Correspondents.

SPECIAL NOTICE.

In consequence of general reduced supplies of paper, as the result of prohibition of the importation of much wood pulp and grass, a smaller space will be available until further notice for replies to correspondents.

Moreover, we will answer by post if stamped and addressed envelope is enclosed for reply: 5-cent. International Coupon, from readers abroad.

The full questions and answers will be printed only in the case of inquiries of general interest.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

E. K.—You can get all particulars of frame-making tools from Messrs. Melhuish, Ltd., Fetter Lane, E.C. We are sorry we have not their catalogue here, but in any case prices in it would probably now be out of date. About your nearest firm, and the one nearest to you, is Messrs. Bennett and Jennison, Ltd., Wellington Works, Weelsby-street, Grimsby. We are sorry we have no information as to wages of picture-frame makers.

C. T.—It would probably cost you several times what the lens is worth, and considerably more than the price of a portrait lens working to focus, to have new correcting glasses supplied. You might ask a firm such as Messrs. R. and J. Beck, Ltd., 56, Cornhill, London, E.C., to quote you a price, but if we were you we should sell the lens and buy one of the ordinary type. These old non-achromatic portrait lenses give very good results, but many like yourself, do not like to be bothered with the adjustment of focus.

T. J.—If you copy half tone illustrations on process plates and make negatives as good as can be made on these latter, lantern-slides from them are bound to show considerable structure when magnified on the screen. One way of getting over this is to make the negative on a rapid portrait plate. Unfortunately, you then lose a good deal of vigour, but probably you can get sufficient for your purpose by printing from the negatives on gaslight lantern plates, using a developer like hydroquinone made up with caustic soda, which gives contrast.

A. G.—1. Alcohol, from any pharmaceutical chemist. 2. If you mean finely powdered Indian ink, it is not sold. You can either buy the sticks or liquid preparations from dealers in drawing-office materials. 3. No objection to using lead in repairs of developing tanks. 4. If you have plenty of calcium chloride, say seven or eight pounds in a tin such as an ordinary despatch case, probably three or four hours will be ample to dry the paper. But, of course, everything will depend on the dryness of the chloride.

SAFE LIGHTS.—Could you please tell me what preliminary coating to use on glass before floating with gelatine and dye solution in making safe lights, as I find in using formula from the "B.J.," p. 317, that as soon as the gelatine is bone dry it peels right off the glass? What is the best gelatine to use? Have tried a fixed-out dry-plate, with the same results.—T. N.

You can give a preliminary coat of albumen or gum, but your difficulty is probably due to the use of too hard a gelatine. Use a soft gelatine, as supplied for cooking purposes, and avoid rapid drying.

A. J. W.—The button cameras came largely from America, and therefore, owing to prohibition of imports, are scarce. Your best chance of buying one is from the second-hand dealers, such as those whose advertisements you will see in our pages. As regards licence, the practice of the police authorities, who regulate the users of such apparatus, varies a good deal. In some places they make the man take out a hawker's licence, at the cost, we

think, of 5s., but in other places there is no restriction. Any head police office in the district where you intend working would give you the information.

G. E. R.—We think your difficulty lies in the handling of the prints. So long as the developer is reasonably fresh you may be certain that it is not the cause of the stain. Our advice to you is to use invariably an acid fixing bath and a print paddle—the latter any light strip of wood with rounded edges. If you immerse each print as it comes from the developer well under the surface of the fixer, and keep it there for a few seconds by means of the paddle, we think you will find you will get no more stains. As good a formula as any for the acid fixer is 4 to 6 ozs. of hypo and ½ to 1 oz. of potass. metabisulphite in 20 ozs. of water.

SALONICA.—A process such as that of Mr. John Sterry, published some years ago, is perhaps what you are seeking. The negatives are immersed for thirty minutes in:—Potass. carbonate, saturated solution, 2 ozs.; glycerine, 1 oz.; formaline, 1 oz.; tap-water, 50 ozs. All by measure. Let the plates soak in this for about half an hour, and then put them aside to dry slowly; it will take from six to twelve hours. If then a narrow edging is cut off all round the negatives with a sharp knife the film within this edging can be raised at one corner, and then steadily pulled off. If preserved between flat cards or in the leaves of a book the negatives can be kept indefinitely.

S. H.—Books on colour photography are very few and not very good. About the only one which is worth while to recommend to you is "Photography in Natural Colours," by Dr. Konig (Iliffe, price 3s. 5d.), but it deals with the later processes, and next to nothing of Autochrome or Paget. On these latter the only literature, apart from what has appeared in the photographic journals, is the books and leaflets which are obtainable from Mr. T. K. Grant, 89, Great Russell Street, W.C. 1, and from the Paget Company, Watford. Practically the best notes and papers on the processes are in the journals. There is a little book on "Colouring Photographs and Lantern Slides," by R. Penlake, price 1s. 8d., from Messrs. Iliffe, 20, Tudor Street, E.C.

S. W.—The arrangement for lighting shown on your sketch should answer very well. A French grey would be suitable for the walls. You can of course have a darker tint if you provide a good sized reflector. We have found 200 or 250 c.p. sufficient for a 1/1pl. enlarger, unless the negatives are very dense. Even then a long exposure will give you good results, while for thin and medium densities the light is ample. If you can dispense with a condenser and use reflected light you will want about four 500 c.p. lamps. Enclosed arcs are best for this. Using f/4.5 and Ilford Zenith or Imperial Flashlight plates your exposures with six 1,000 c.p. lamps should be from 1 to 3 seconds, according to distance between sitter and light.

P. L. M.—Various dodges have been used to dull the surface of metal articles so as to avoid the occurrence of reflections. For example dabbing with putty or depositing a thin layer of magnesium oxide by burning magnesium ribbon, or spraying with a neutral colour with an air-brush, or in the case of a vase putting ice in water contained in it so as to give a deposition of dew on the outside. But none of these methods are so efficient as placing the article to be photographed in a miniature studio entirely enclosed with muslin, except at one part, where a high-power lamp can be put, in order to give the necessary relief of lighting. The little manual "Commercial Photography," supplied by our publishers, price 1s. 2d. post free, gives detailed instruction.

FIXING-HARDENING.—Will you kindly let me know the best hypo bath to prevent my plates frilling? My dark-room is very small and the incessant heat softens the film. I tried adding alum to the hypo, but got a milky coating over the negatives which was very difficult to remove. I want a bath that will fix and harden them in the one operation.—A. J.

Addition of alum alone to the hypo bath is very bad practice since it gives a bath which not only is milky but will readily cause stains to develop afterwards in the negatives. A suitable hardening bath consists of 20 ozs. of saturated solution of alum, 4 to 7 ozs. of saturated solution of sodium sulphite, and from 20 to 28 ozs. of hypo solution containing 1 part of hypo dissolved in 5 parts of water.

COPYING LENS.—Will you kindly let me know if you can copy photographs on a half-plate with a 5-in. focus wide-angle lens, which I purchased some time ago as a half-plate wide-angle lens? I have only the ordinary double extension camera and I could not use a large focus lens with such extension.—R.A.

Provided that the 5-in. lens covers a half-plate in the ordinary way satisfactorily (it should do so) there is no objection to its use for copying, except that it becomes rather slow. If you are copying same size (extension of camera 10-in.) the f/16 marked on your lens becomes f/32, and the same applies to every other stop and still more when you are copying-enlarging. If your camera extension is 20 in., the 5-in. lens would allow you to enlarge when copying to about 3 diameters.

C. W. A.—If your business is carried on out of doors, as we suppose, by canvassing people or establishing yourself on a pitch and waiting for people to come to you, then we should say you do not come within the scope of the so-called Retail Business Licensing Order, the office of which for your district is Iddesleigh Mansions, London, S.W.1. But in many districts the police require a photographer carrying on a business of this kind to take out a hawker's license at the cost of, we think, 5s. 2. There are many restrictions on photography, for example in the parks, County Council gardens, Hampton Court grounds, etc. If you buy a copy of the Wellcome Exposure Record, which you can get at any photographic dealers for 1s. you will find full particulars there where to apply for permission in places where it is needed.

C. P. L.—1. The camera we referred to was the "Sibyl," of Messrs. Newman and Guardia. The baseboard covers the lens; the focussing movement is operated by a finger lever on the front of the baseboard; though the lens front does not come automatically into working position when the camera is opened, it is almost automatic, and the mechanism is much less liable to derangement than the spring-operated automatic cameras which one has had but which have not been successful on the market. 2. We do not know of any special description of easel for colouring photographs. Professional colourists usually use the ordinary artists' easel as supplied by Messrs. Winsor and Newton, 37-40, Rathbone Place, Oxford Street, W.1. Amateur colourists have a very good easel supplied by Messrs. James A. Sinclair and Co., Ltd., 54, Haymarket, S.W.1.

The British Journal of Photography.

Line Advertisements.

Charges for Insertion.

Since advertisements cannot be inserted until fully and correctly prepaid, senders of line announcements are asked to bear in mind the scale of charges. They will thus save themselves delay in the publication of their announcements. A Schedule by which an advertisement can be correctly priced will be sent on request.

Net Prepaid Line Advertisements.

12 words or less 1/-
Extra words ... ... 1d. per word.
(No reduction for a series.)

Special Note. Box Number Advertisements.

"Box No." and office address ... ... charged as 6 words.
For forwarding replies add ... 6d. per insertion for each adv't.
If replies are called for this latter charge is not made.

Advertisements cannot be inserted until fully and correctly prepaid.

Orders to repeat an advertisement must be accompanied by the advertisement as previously printed.

Advertisements are not accepted over the telephone or by telegram.

The latest time for receiving small line advertisements is 12 o'clock (noon) on Wednesdays for the current week's issue.

Displayed Adv'ts should reach the Publishers on Monday morning.

The insertion of an Advertisement in any definite issue cannot be guaranteed.

HENRY GREENWOOD & CO., Ltd., Publishers,
24, Wellington Street, Strand, LONDON, W.C. 2.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3085. Vol. LXVI. FRIDAY, JUNE 20, 1919. Price Twopence.

Contents.

	Page
Ex-Cathedra	345
Stereoscopic Photography. By C. E. B.	346
Camera Movements. II. By D. Charles	348
Practices in the Studio. By Practicus	349
Colour Values in Monochrome, and a New Viewing Filter to Assist in Obtaining Them. By F. F. Renwick	351
Examination Questions in Photography	353
Patent News	355
Photo-Mechanical Notes	355
Meetings of Societies	357
Commercial and Legal Intelligence	357
News and Notes	357
Correspondence— Photographers' Annual Holiday—The London Salon of Photography—Stereoscopic Photography—Assistants' Wages	358
Answers to Correspondents	359

SUMMARY.

The interior decoration of the studio has hitherto been done on somewhat cautious lines; in an Ex Cathedra paragraph we detail an example of rather daring treatment which has proved attractive without detriment to the work. (P. 345.)

A lens chat forms the "Practicus" feature this week. The writer without specifying various makes deals with the general qualities of such lenses as are likely to find their way into the hands of the portraitist. (P. 349.)

The questions set at the recent examination of the City of London and Guilds Institute in the ordinary grade, Section B, of photo-mechanical processes are given with suggested answers on page 353.

The concluding portion of the paper by Mr. F. F. Renwick on colour values in monochrome will be found on page 351.

The second of a series of articles on stereoscopic photography deals mainly with portraiture, a branch which we fear has never received the attention which it deserves. (P. 346.)

An important communication as to the necessity for licences for new photographic businesses, giving a list of branches for which no licence is required, appears on page 357.

The present instalment of "Camera Movements" gives a fully detailed explanation, with diagrams, of the function of the rising front and swing back, with hints on the use of the spirit level. (P. 348.)

A hint useful to all who have to copy matt-surfaced prints and are troubled with "graininess" will be found on page 355.

Under the heading of "Patent News" we give abstracts of specifications of a folding pocket camera and an electric retouching device, together with a list of recent applications. (P. 356.)

Modifications of the Coal, Gas, and Electricity Rationing Order which will be in force for some considerable time are detailed on page 357.

Letters from an assistant and from an employer on the wages question, a note on stereoscopic separation, and holiday closing in Londonderry will be found in the correspondence columns on page 358.

Hot weather troubles, studio illumination, backing plates, and tank development are, with other subjects, dealt with in "Answers to Correspondents." (P. 359.)

The desirability of avoiding the use of misleading descriptions of printing processes, frames, and the like as a stimulus to a better class of business is pointed out on page 345.

A suggestion for producing advertising specialities and souvenirs might perhaps be carried out by the aid of carbon or transferotype by the ordinary photographer. (P. 355.)

EX CATHEDRA.

The Real and the Imitation. In nearly every branch of commerce we find imitations masquerading under names as closely approximating to that of the genuine thing as the law will allow. We have rolled gold, which is the thinnest possible film of genuine metal which can be made by mechanical means, "Walnut finish" furniture, which is white wood stained brown, and others too numerous to mention. In photography we find the same idea not carried so far, but sufficient to mislead those who are not acquainted with the technics of photography, especially as regards printing processes. The word "platino" is very loosely employed; for instance, we see "platino panels" or "platino sketches" which have no more platinum in them than there is in a piece of newspaper. In the same way we have "carbon" papers of various kinds, which are as far removed from genuine carbon prints as it is possible to be. Gilt frames are innocent of gold, the colour being obtained by lacquering white metal, but this is not known to the public, who would often prefer "English Gold" if the difference were clearly pointed out. With prints the same result would in many cases be secured, that is to say, people would be glad to have real platinum and carbons for the sake of assured permanency. There are many other instances which could be given, but we will content ourselves with mentioning one only—the practice of calling coloured photographs oil paintings or water-colours. This is not, perhaps, so extensively practised as it was some years ago, but it is to be discouraged, and the use of the term "finished in oil or water-colour" should in every case be used.

* * *

Colour and Aspect. When decorating a studio the effect of the aspect upon the colour used for the walls is very often overlooked, the colour being chosen either according to the personal predilections of the proprietor or for some more or less imaginary photographic value. The trained art decorator works on a different plan, and usually endeavours to brighten up a room with a northern aspect, and to produce a cooler or more subdued effect on one facing south or west. This idea is rarely followed out in studio decoration, for in this we usually find that cool colours are employed, while the room itself has, in the great majority of cases, a northern aspect. There is really no good reason for this, and we think that a little more daring might be shown in the choice of colours. We have recently visited a studio with a northern aspect, the walls of which are painted a deep orange chrome, relieved by a skirting and frieze of dark, almost indigo, blue, and found after recovery from the first shock to our conventional ideas that the combination was quite pleasing and free from any garish effect. It might be imagined that the effect of painting the walls with a colour which is

practically black from a photographic point of view would be to interfere seriously with the lighting, but an inspection of the work done proved that this was not so, for although the artist favoured rather strong effects, there were some quite silvery in character, and as a whole there was no difference between them and pictures made in a studio with the orthodox greyish interior. This opens out a wide range of possibilities in decoration, colours which have always been considered as tabu being apparently quite innocuous as far as the work is concerned We have always been opposed to the very light colours which most photographers have considered to be essential, and have found a great improvement in lighting with a west-lighted studio in changing the walls from a light French grey to a rather dark greyish green, more brilliant negatives being thus secured. Our older readers may recollect that a good many years ago an "orange pea-green," whatever that may be, was strongly recommended for photographic reasons, so that the idea is not quite a novel one. But the lesson remains that we may indulge our artistic instincts in decoration to a much greater extent than we have done without bringing discredit upon our pictures. It may be worth adding that only ordinary plates were used in the orange-lined studio.

STEREOSCOPIC PHOTOGRAPHY.

III.—Stereoscopic Portraiture.

It is hardly sufficiently realised how valuable stereoscopic photography is in the province of portraiture. No one who has ever seen a really successful stereoscopic portrait can have failed to remark upon the almost uncanny realism of it. To the artist it is perhaps too gross a realism. It has that death-in-life or life-in-death quality which is the bane of the wax-work show, and yet apart from that there is a preciousness about such a vivid relic of a dead or absent friend that must be recognised. How religiously we should cherish, if it existed, such a presentment of any of the "great ones gone," or, to bring it closer home, of some dear departed member of one's own family. The professional photographer never seems to have found it worth while to push this branch of his work. Perhaps he knows his public too well to venture on the enterprise of stereoscopic portraits. Whether this is so or not the amateur need have no hesitation in taking up the work, and if he will do so he will be surprised and delighted at the results, as will his sitters also.

It is hardly necessary to point out that for stereoscopic portraiture twin lenses and a stereoscopic camera are practically essential. To take successive portraits in the hope that no movement will have occurred in the 30 seconds or so occupied in the changing of camera position would be futile, and the use of mirrors with a single lens would mean a reversal of the image fatal to correct portraiture. Pinhole photography is unsuitable owing to the long exposure required, and the twin-lenses arrangement seems the only way to ensure perfect results.

The surroundings and background having been appropriately arranged, the principal light should be well concentrated on the face of the sitter. A three-quarter-length will generally be the most effective portrait.

It should be known that in the case of a plain background the prints may by suitable masking be made to show a head or, indeed, any object well in front of the picture plane. To effect this the background is masked in two circles, squares, or ovals of equal size, the two being at the extreme limit of $2\frac{3}{4}$ inches apart, while the portraits themselves are only separated by $2\frac{1}{2}$ inches. This means that the head in the left picture is a little to the right of the centre of its background, and in the other a little to the left of the centre, the backgrounds being, of course, the same size and shape. The result is a portrait standing as it were solidly in space with a background well behind. If the masking is carried out the other way, bringing the head in the left-hand picture to left of centre and in the right-hand picture to the right, the portrait will recede behind the picture plane. This is always the best way of masking a landscape and generally best for a portrait. The effect then is that of a picture seen through a frame; occasionally, however, in portraiture, an amusing effect is procured by the opposite plan, allowing the head to look out from beyond the frame. In stereograms of such subjects as museum exhibits—a fossil or a mineralogical specimen—it is also generally best to mask so that the object is in front of the picture plane.

The chief drawback to stereoscopic portraiture is the need of a stereoscope to view the results. This objection must, of course, be admitted, but it should be pointed out here

Stereoscopic portrait of the late Washington Teasdale.

that the knack of seeing stereoscopically without any instrument is so extremely easy to acquire that it is a great pity it is not more general. Most people can learn the way to do it after one or two trials, and then with a very little practice it becomes practically instinctive. The writer scarcely ever uses the stereoscope, and never has a moment's difficulty in combining the elements of a stereogram with the unaided eyes. It is very advantageous in mounting stereograms to be able to do this, as it precludes any possibility of mistaking the right-hand for the left-hand picture. It is also convenient to be able to enjoy stereograms in a book just as well as on separate cards.

The way in which it is done is a little difficult to describe in words, but briefly it consists in fixing the eyes on an imaginary distance as though looking through the stereogram at something beyond. This involves no squinting; there is no more convergence of the eyes than in looking at any object a yard or two away. Probably the only difficulty in seeing stereograms in this way is that while looking through at the imaginary distance one naturally focuses the lens of each eye for that distance, whereas this instinctive tendency has to be resisted as we require to *focus* them for the stereogram while *converging* them for a more distant object. The art of doing this soon comes, and with a little practice one learns to combine readily pictures even as widely separated as four inches or more. If the faculty of stereoscopic vision were more widely cultivated stereoscopic portraiture would be proportionately more popular.

In stereoscopic portraiture it is tempting to introduce intricate accessories to add to the magic of the stereoscopic relief. The accompanying portrait of the late Mr. Washington Teasdale with his "geometric pen" is a good example. The photograph necessarily loses much detail in reproduction, but the orginal is strikingly effective in its fidelity to the intricacies of the apparatus, with its levers and cogwheels. On the other hand, pure portraiture with a plain background lends itself to stereoscopic treatment almost more wonderfully, as it keeps the attention concentrated on the figure, and we really get as near an approach to an actually "speaking likeness" as mechanical means can accomplish. A good example is shown in the second illustration, in which all accessories are avoided.

There is one important point in stereoscopic portraiture—the process which goes by the name of retouching must be eschewed, unless the retoucher is particularly skilful in treating the two pictures exactly equally, and even then much less should be done to the negative than is usual in professional photography. The illustration, a stereogram by Mr. Oscar Way, of Colchester, is an example of the retouching of a print carried as far as is practicable for the stereoscope without sacrificing relief or losing the character of the sitter.

Stereoscopic Portrait by Oscar Way, Colchester (slightly retouched).

Retouching in portraiture generally has come to be considered necessary, largely because the public will inspect a photograph at a proximity to the eyes at which they would never think of scrutinising the painting of an artist. The lines which the retoucher so carefully eliminates in deference to public taste in the matter of wrinkles are not really the blemishes that they have come to be accounted. In them a great part of the character resides, and if they show unduly it is often that the lighting has not been judiciously arranged, or that the print is being examined from too close a point of view. Place an untouched print in a frame on the wall and view it at a reasonable distance. It will be seen at once to be immeasurably superior both as a likeness and an artistic production to the smooth, characterless wax effigies which so many photographers turn out—not perhaps to please their own taste, but simply because their public will have it so.

Now, in stereoscopic photography retouching is not very practicable, for any marks made by hand are apt to show up, in mid-air as it were, in the stereoscope, nor will it be found that even popular taste will object to the true

presentment of lines and wrinkles in a stereogram. So that in stereoscopic portraiture the photographer is happily saved by the very necessities of the process from a practice which is of doubtful advantage in portraiture in any case, and beyond that is generally carried to an extreme that to the true artist borders on the offensive. In speaking of "retouching" we are not, of course, including mere "spotting out" or the removal of mechanical defects in a negative caused by dust particles, etc. Freckles, too, by their non-actinic colouring, are unquestionably too conspicuous on a photograph, and it is often desirable to remove this defect by working on the negative. To the elimination of such spots no objection can be raised, though possibly a certain amount of valuable time is sometimes wasted in getting rid of specks so microscopical that their presence or absence is a matter of absolutely no importance.

C. E. B.

CAMERA MOVEMENTS.

II.

The previous article described the various possible adjustments, or movements, as they are usually termed, that a stand camera should be provided with, but it pointed out that they are seldom, if ever, all found in one camera. Probably there is scarcely a stand camera built nowadays that has not at least a rising (and falling) front and a swing-back, and these are the movements not already sufficiently explained which are most used, and they will therefore be considered first.

Supposing it be required to photograph a building, a church, for example, the camera is set up pointing towards it and levelled by means of a spirit-level. If notice has been taken of what has already been written, the front and back of the camera will be perfectly vertical. If the camera is stood up far enough away to include the whole of the church when the camera is level and the lens central, it will be noticed on the focussing screen that nearly half of the image consists of foreground, road or field, may be, and that the subject itself, the building, occupies the other half, and therefore looks insignificant. The reason for this is very simple. The camera is looking straight towards the building, and the level of the lens is about half-way up the door. As the lens level is the centre of the ground-glass, it follows that there will be as much included below the centre of the subject as above it. To photograph the church with the camera level as described from a nearer point, so as to get the image larger and with less foreground, it would be necessary to raise the whole camera opposite to the centre of the subject, which is seldom possible. However, the rising front enables the desired result to be obtained in most cases while the camera is still standing on the ground. It appears miraculous to some people that the effect of raising the lens an inch will give the same effect as raising the whole camera twenty or thirty feet perhaps, but the following explanation should make the reason clear:—

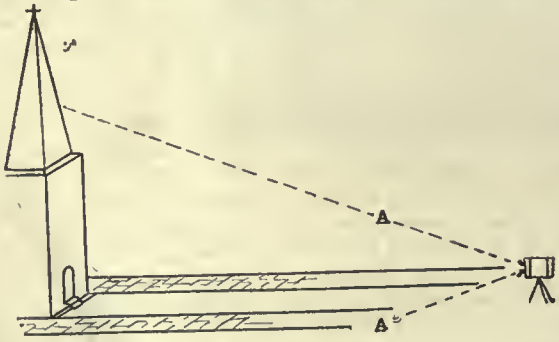


Fig. 1.

Fig. 1 represents the camera set up opposite the church at a distance that will give it a nice size on the plate, and on levelling it is found that the image includes what is between the lines AA, and the effect on the ground-glass is seen diagramatically by the solid lines AA in Fig. 2, where the point of the subject that is on a level with the lens is found in the centre of the ground-glass and is marked with an X. The image of the steeple is formed in the margins of the circle of light produced by the lens, but is outside the area of the ground-glass, as shown by the dotted lines. If the lens is raised the image formed by it is raised also, so that the steeple can be brought into the picture quite easily. The whole image moves, remember, so that when the lines BB are raised till they correspond with the edges of the ground-glass AA, it is obvious that as more of the image is slid into view on one edge, an exactly equal amount is slid off the ground-glass on the other. The image is there all the time. One simply slides the portion one wants of it on to the focussing screen.

A cross-front, a sliding movement from side to side, works in exactly the same way when it is required to include more of the subject on one side of the plate and less on the other, when it happens that one cannot stand opposite the middle, but, still, a perspective view is not wanted. This is especially useful in copying to adjust the image centrally on the ground-glass.

It may happen that the amount of rising front is not enough to include all of a building; for instance, where the latter is extra tall, or where it is not possible to get further away to include more of the view; or it may be that the definition at the margin of the image is not good enough to show the subject properly. In that case the proper course is to tilt the camera so that the lens points upwards. That is to say, to point the lens towards the centre of the subject required on the ground-glass. Here, however, it must be pointed out that if the whole camera is pointed upwards we shall get a distorted view. The top of the church is further from the lens than the lower portion, and therefore will appear smaller in proportion, with the result that upright walls will slant towards one another on the ground-glass just in the same way as the sides of the road do, but the latter appears in correct perspective and the former will look absurd. This is corrected by always keeping the back of the camera level and vertical, and if this is done, perpendicular lines in the subject will be vertical in the image, however much the lens is tilted upwards.

In using the rising—or cross—front, we use the margins of the light-circle made by the lens, and as this portion of the image is usually not so well defined as the centre, it may be necessary to "stop down" the lens, that is, to reduce its aperture, in order to get sharp detail.

When using the swing-back vertical when the lens is pointed upwards, it will be noted that the part of the ground-glass where the image of the top of the building falls is farther from the lens than the part where the lower portion of the building is projected. Now, to get the maximum sharpness in the image, the ground-glass should be *closer to* the lens for a distant object than for a near one. So when the swing-back

is employed for getting proper uprights in a photograph, we are reversing the normal order of things as regards focussing,

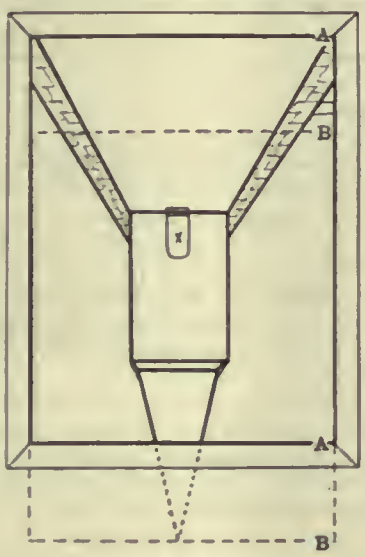


Fig. 2.

and the image will therefore be a good deal "out of focus" in some parts. For that reason, again, it is necessary to stop down considerably to correct the want of sharpness. Usually the amount of stopping down required is less in the use of the rising front than in employing the swing-back. That is to say, the latter requires a much smaller aperture (which means longer exposure) than the former, so that the rising front is preferably used where the lens will produce a sufficiently good marginal image. Very often it happens that either of these movements alone will still not include as much of the upper part of the subject as is desired, and in such cases the only thing is to slide the lens up as far as it will go and then point the camera upwards till the required view is obtained, when the ground-glass is brought to a vertical position again by means of the swing-back. This combined movement calls for a very small aperture in the lens, and care should be taken that the bellows do not cut off part of the image. They are usually provided with rings to hook on to the camera-front to prevent sagging in this way.

To get the maximum sharpness after adjusting the camera as described, an easy way is to mark on a strip of gummed paper on the baseboard when the lens is focussed on the most distant part of the subject, then mark again when the nearest part is sharp. Then rack back two-thirds of the space between these two marks, and use the smallest aperture of the lens.

The best kind of level to employ in getting the swing-back

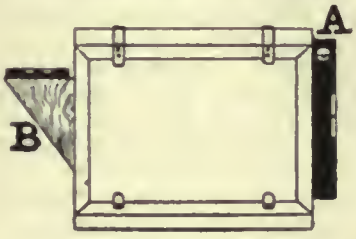


Fig. 3.

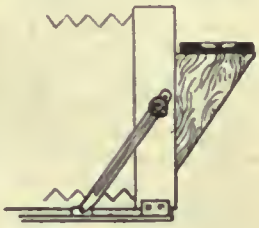


Fig. 4.

perpendicular is one with a cross level let into one end of it A, or a small level may be fixed to one side of a piece of wood very accurately cut to a right-angle B (Fig. 3). This level is placed just against one side of the camera, as in Fig. 3, and the centre leg of the tripod moved to get the bubble central. The leg is moved in the direction the bubble is required to go. Then the level is placed against the ground-glass (Fig. 4), and the back swung till the bubble is again central.

D. Charles.

(To be continued.)

PRACTICUS IN THE STUDIO.

[Previous articles of this series, in which the aim of the writer is to communicate items of a long experience in studio portraiture, have appeared weekly since the beginning of the present year. It is not thought possible to continue the series to the length of that by the same writer which ran through the "British Journal" some years ago, but if any reader among the younger generation of photographers, and particularly those engaged as assistants, has a particular subject which might be dealt with, his or her suggestion will be welcomed. The subjects of the previous articles of the series have been as follows:—

A Talk About Lighting (Jan. 3).
The Camera and the Lens (Jan. 10).
Managing the Sitter (Jan. 17).
Backgrounds (Jan. 24).
Studio Exposures (Jan. 31).
Artificial Lighting (Feb. 7).
Printing Processes for Portraiture (Feb. 14).
Studio Accessories and Furniture (Feb. 21).
The Surroundings of the Studio (Feb. 28).
Studio Heating and Ventilation (March 7).
The Postcard Studio (March 14).
The Printing-Room (March 21).
About the Reception Room (March 28).
Home Portraiture (April 4).
Portable Studios (April 11).
Copying (April 18).
Handling the Studio Camera (April 25).
More About Lenses (May 2).
Enlargements (May 9).
Advertising the Studio (May 16).
Mounts and Mounting (May 23).
Business Methods (May 30).
Photographing Children (June 6).
Portraits of Elderly People (June 13).

SOMETHING ABOUT LENSES.

The lens is the most important item in a photographer's outfit; it is also the one about which he knows the least, and he often pays dearly for his ignorance. There are so many varieties of lenses—or perhaps I might more correctly say lens names—that a mere list of them would go far to fill the space allotted to this article, so that I will not attempt to enumerate them all, but to deal with the characteristics and capabilities of those which are most likely to be met with by the photographer in the ordinary way of business.

Portrait lenses will naturally be of the greatest interest to the majority of my readers, and I may point out that at the present day there are many which may be included in this class, although they are not listed under the special name, for there is nothing distinctive about a portrait lens, except the feature of a comparatively large aperture, which allows of short exposures being made indoors. I am inclined, therefore, to class as portrait lenses all which have a maximum aperture of not less than $f/6$. The old type of portrait lens, often called the Petzval, after its original designer, is

of little use for anything but studio work, as when used out of doors with a moderately small aperture it was prone to give a pronounced central flare spot which was fatal to good work. Still, the smaller sizes up to 8 or 9 inches focal length are sometimes used successfully upon reflex cameras when very short exposures are required, the full aperture of *f*/3 or *f*/4 being then employed. They may also be used for copying photographs or other subjects where absolute rectilinearity of the lines is not essential. This type has a deeply curved field and considerable astigmatism at the edges of the field; therefore it should not be pushed to the limit of its capacity; a good specimen will, however, cover a field the diagonal of which is about two-thirds the focal length of the lens to be used. For example, a ten and a-half or eleven-inch lens will do very well at a fairly large aperture for a cabinet picture, assuming this when trimmed to measure 5¾ x 3¾ inches. For very short studios, therefore, it is better to employ an anastigmat which will cover a much larger field without stopping down. Curvature of field is not such a serious objection in portraiture as in other classes of work, as the subject is not all upon one plane, and the curvature allows of the face, hands, and knees being sharply rendered with a larger aperture than can be used in a flat field lens, although the latter would give better general definition with a standing figure. Although I referred to the matter last week, it is worth repeating that the front combination of a portrait lens used alone gives a good image with slightly softened definition, and has a focal length of about one and a-half times that of the complete lens. It is useful to remember this when it is desired to make a rather larger head than usual when only a short-focus lens is available. The exposure required will be about double that of the complete lens, and, if perfectly sharp definition be required, a slight reduction of the aperture will be necessary. The quickest portrait lenses have an aperture of nearly *f*/2 and the slowest *f*/6, the latter being also adapted for groups, and under favourable conditions to outdoor work. Several makers have issued portrait lenses which are adjustable to give a soft image if wished. .

All the more rapid forms of anastigmat answer excellently for studio portraiture, but care should be taken not to select one of too short focal length. Good perspective or "drawing" is only to be obtained by the use of a fairly long focus lens, and the mere fact that the plate is perfectly covered is of little moment compared with this. Unfortunately, extra rapid anastigmats are very costly in the larger sizes. Referring to the pre-war list of one maker, I find a 16-inch *f*/4 portrait lens quoted at £26, while a 15-inch *f*/4.5 anastigmat costs £30, the next size larger, an 18-inch, being still more expensive—namely, £40. The covering power of the latter is, however, much greater, and they are free from flare; hence they will also serve for outdoor work on large plates.

Besides portrait lenses, properly so called, there is a class known by various trade names, such as Euryscope, Universal Symmetrical, Portrait Aplanat, etc. These are of the rapid rectilinear construction, but have apertures of *f*/5.6 or *f*/6. They answer well for portraiture, but their field of sharp definition at full aperture is limited. If one having a focal length nearly twice the longest side of the trimmed print is selected, it should be found satisfactory. These lenses are free from flare, and when stopped down will do all the work of a rapid rectilinear. It is worth noting that the appellation "Aplanat" only means that the lens is free from central spherical aberration; it does not denote any anastigmatic or "flat field" properties. I mention this because in some quarters there is an impression, often fostered by dealers, that an aplanat is a variety of anastigmat. A generation ago Grubb applied the term to single lenses and rectilinears.

Rapid rectilinears having apertures not smaller than *f*/8 are frequently used for large sizes in portraiture, and with the fast plates now available are quite rapid enough in action Even when more rapid lenses are used, it is generally found necessary to reduce the aperture when taking large heads, in order to obtain depth. At one time it was averred that rectilinears gave an image which lacked plasticity and had a "cut out" appearance; but this opinion does not seem to be held nowadays.

Single lenses are sometimes employed in artistic portraiture, and if used at a sufficiently large aperture give a pleasingly soft definition between the sharpness of the ordinary lens and the pronounced fuzziness of the anachromats. Old landscape lenses of large diameter can often be very cheaply purchased, and after removing the fixed diaphragm, which is usually about *f*/16, are ready for use. As I propose to deal with soft-focus portraiture as a separate subject, I shall not deal with lenses specially constructed for this work in the present article.

For groups many types of lenses are pressed into service, the portrait lens being the least suitable, as its curved field renders a special arrangement of the sitters necessary, while the small aperture which has to be used to get even passable definition to the edges of the plate make it very slow in action for studio exposures. Rectilinears do better at the same relative aperture, but it is here that the anastigmat is seen at its best. With a good lens and a judicious use of the swing back it is possible to secure uniform sharpness throughout with a comparatively large aperture; but one precaution is necessary—that is, to use as long a focus as the studio will allow, otherwise the figures in the front row will appear noticeably larger than those in the back; and this is generally objectionable, even to the untrained eye of the client. The photographer should never accept the optician's classification of lenses as regards the sizes covered, as the excellent quality of most of the newer lenses justifies the makers in listing a nine-inch lens for whole plates or a 13-inch for 12 x 10; but if such lenses were used for close-up groups on the size of plate indicated, the perspective would be bad, although the definition might be perfect. I cannot too often repeat that the quality of a lens has nothing to do with the rendering of perspective, this being solely a matter of focal length in relation to the size of plate used. The cheapest single lens and the most perfect anastigmat, if of equal focal length, will give the same perspective at the same distance from the group upon the same size of plate. It is purely a matter of angles, as an experiment with a pinhole will prove. If we arrange a group of articles—sacks, boxes, or whatnot—and take photographs with a nine-inch lens and with a pinhole placed at nine inches plus the addition to the back conjugate necessary for the nearness of the object, we shall obtain exactly the same drawing. The moral is to use for all work as great a focal length as conditions will allow.

There is a host of other models which have their various uses in outdoor and interior work, copying, etc., but which are of little value for portraiture. Rapid rectilinears I have already mentioned, but they may be used for nearly all photography where the greatest rapidity is not essential. Architecture copying, catalogue work, and landscape are all within their scope, and if of good quality they will be found little inferior to anastigmats. Wide-angle rectilinears and portable symmetricals are designed for work in confined positions, as buildings in narrow streets, interiors, and for copying. They usually have an initial intensity of *f*/16 only, and this is to my mind a serious drawback, as it is often difficult to focus a dimly lighted interior with so small an aperture; therefore, I advise that when expense is not a primary consideration, small anastigmats with apertures of *f*/7.7 or larger should be used. It is easy to focus with these at full aperture, and to stop down to obtain the neces-

sary depth of field; another advantage is that the lens is available for rapid work on a smaller plate; thus in my own practice I use a 5½-inch anastigmat as a quarter-plate hand camera lens, and also as a wide-angle lens on a whole plate, while an 8-inch serves in the same way for half-plate and twelve by ten.

An old type of lens not now made, but frequently to be met with, is the triplet, or triple achromatic. It is a splendid copying lens, good for architecture, landscape and groups; in fact, it will do all that a rapid rectilinear will do, and at equal apertures I even fancy the general definition it gives to be superior. Its great fault is slowness, the full aperture being usually *f*/12. This, however, is not a great objection for the larger sizes of plate, as considerable stopping down is usually necessary to secure depth.

Single or landscape lenses deserve more consideration than they usually receive from professional photographers. They have two faults—slowness, the full aperture being usually *f*/15 or *f*/16, and a tendency to curve straight lines near the margins of the picture. In the best makes the latter defect is not present to any harmful extent if the focal length chosen is at least as much as that of a rectilinear lens made for the size of plate to be used. The great advantage of the single lens is the crispness and brilliancy of the image which is obtained in outdoor work, especially open landscape. If we take a first-rate modern lens and an old wide-angle landscape lens and give both identical exposures upon a well-lighted open subject, the latter will win every time on points for the quality of negative. Still, we cannot carry round a bagful of lenses, and so the single combination one is often left at home; but one often feels that, after all, it would be wise to bring it along when on view work pure and simple.

PRACTICUS.

COLOUR VALUES IN MONOCHROME, AND A NEW VIEWING FILTER TO ASSIST IN OBTAINING THEM.

[The following paper, read by Mr. F. F. Renwick before the Royal Photographic Society, deals with a problem which is always present in the translation of colours into monochrome. The author's exposition of recent research will help to make clear the complex nature of the problem and the orthochromatic worker will welcome the promise of more definitive methods which is contained in the latter portion of the paper.—EDS. "B.J."]

(*Continued from page* 336.)

This was done by first plotting Abney's scale numbers against the wave-lengths corresponding thereto to obtain the calibration curve (Fig. 3) of his instrument. Now the length of *normal* spectrum included between the jaws of the slit is, at any point, proportional to the tangent to the above calibration curve at that

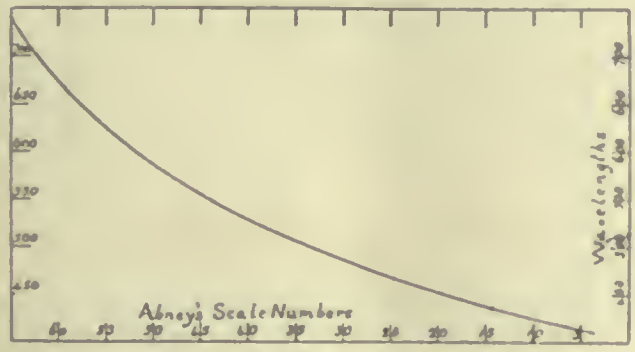


Fig. 3.

point and, for such narrow bands of the spectrum, the required corrected luminosity value at any point may safely be taken as being inversely proportional to the wave-length interval included by the slit.

The ratio of the tangent to this curve (Fig. 3) at any point to the tangent at λ585 (Abney's scale number 50, which he took as his standard of luminosity = 100) is therefore the number by which Abney's observed luminosity value must be multiplied to arrive at the corrected luminosity for that point; this corrected value will correspond to equal small sections of a *normal* spectrum and leave unaltered the value of his standard. These ratios are most conveniently expressed as logarithms, which have only to be added to the logarithms of Abney's observed luminosities to yield the logarithms of the corrected luminosity values.

Thirteen such tangent ratios were found for points five scale numbers apart along the calibration curve, and their logarithms plotted against the corresponding Abney scale numbers; a smooth curve was then drawn through the points. From this curve (Fig. 4) the logarithm of the correction factor can be read off for any point of the spectrum.

In the table are given:—

Col. 1.—Abney's scale numbers.

Col. 2.—Corresponding wave-lengths.

Col. 3.—The luminosity values given by Abney in Table IV., col. 4, of his book, page 94.

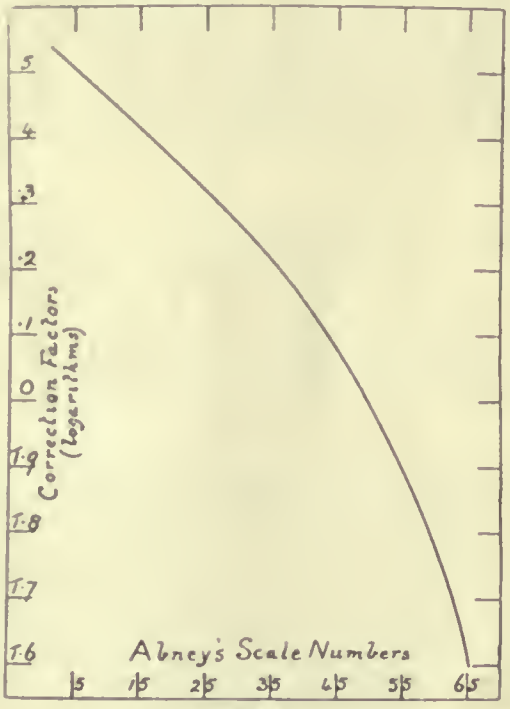


Fig. 4.

Col. 4.—Logarithms of the values in col. 3.

Col. 5.—The correction factor, corresponding to the region of the spectrum, which has to be added to the value given in col. 4.

Col. 6.—The sums of the values in cols. 4 and 5.

It will be observed that the effect of these operations is slightly to shift the apparent position of maximum luminosity, found by Abney at λ585 μμ, towards the blue, to λ572 μμ. To bring back all these corrected luminosities to a maximum of 100 it is, of course, necessary

1 Scale No.	2 Wave-length. A.U.	3 Luminosity.	4 Log. of Luminosity.	5 Correction Factor.	6 Sum	7 Corrected Log. Luminosity.	8 Corrected Luminosity.
0	4010	(·06)	(2·778)	·551	(1·329)	(1·308)	(·20)
2	4062	(·10)	(1·00)	·533	(1·533)	(1·512)	(·325)
4	4106	·14	1·146	·515	1·661	1·640	·44
5	4131	·16	1·204	·505	1·709	1·688	·49
6	4151	·18	1·255	·496	1·751	1·730	·54
7	4174	·22	1·342	·487	1·829	1·808	·64
8	4198	·26	1·415	·478	1·893	1·872	·75
9	4221	·30	1·477	·469	1·946	1·925	·84
10	4245	·34	1·531	460	1·991	1·970	·93
		(·35)	(1·544)	460	(·004)	(1·983)	(·96)
11	4271	·40	1·602	·451	·053	·032	1·08
12	4296	·45	1·653	442	·095	·074	1·19
13	4323	·50	1·699	·432	·131	·120	1·32
14	4349	·56	1·748	·423	·171	·150	1·41
15	4377	·62	1·792	·414	·206	185	1·53
16	4404	·70	1·845	·405	·250	229	1·69
17	4437	·78	1·892	·396	·288	267	1·85
18	4459	·86	1·934	387	·321	·300	2·0
19	4488	·94	1·973	378	351	330	2·1
20	4517	1·08	·033	·369	·402	·381	2·4
21	4548	1·2	·079	·359	·438	417	2·6
22	4578	1·4	·146	349	·495	474	3·0
23	4608	1·6	·204	339	·543	·522	3·3
24	4639	1·82	·260	·329	·589	·568	3·7
		(1·95)	(·290)	·329	(·619)	(·598)	(4·0)
25	4675	2·3	·362	·319	·681	·660	4·6
26	4707	2·8	·447	309	·756	·735	5·4
27	4742	3·5	·544	·299	·843	822	6·6
28	4776	4·0	·602	289	·891	·870	7·4
29	4812	4·7	·672	279	·951	·930	8·5
30	4848	5·5	·740	·269	1·009	·988	9·7
		(5·7)	(·756)	·269	(1·025)	(1·004)	(10·1)
31	4885	7·0	·845	·259	1·104	1·083	12·1
32	4924	8·5	·929	·248	1·177	1·156	14·3
33	4963	10·5	1·021	·237	1·258	1·237	17·3
34	5002	14·2	1·152	·226	1·378	1·357	22·7
35	5043	18·2	1·260	·215	1·475	1·454	28·4
36	5085	24·0	1·380	204	1·584	1·563	36·6
37	5128	29·5	1·470	192	1·662	1·641	43·7
38	5172	36	1·556	·180	1·736	1·715	51·9
39	5221	42·5	1·628	168	1·796	1·775	59·6
40	5270	50	1·699	155	1·854	1·833	68·1
41	5321	57	1·756	141	1·897	1·876	75·2
42	5373	62·3	1·796	127	1·923	1·902	79·8
43	5427	69	1·839	·112	1·951	1·930	85·1
44	5481	75	1·875	·097	1·972	1·951	89·3
45	5538	81	1·908	·082	1·990	1·969	93·1
46	5596	87	1·939	·066	2·005	1·984	96·4
47	5658	92·5	1·966	·050	2·016	1·995	98·9
48	5720	97	1·987	·034	2·021	2·000	100
49	5783	99	1·996	·017	2·013	1·992	98·2
50	5850	100	2·000	·000	2·000	1·979	95·3
51	5921	99	1·996	1·982	1·978	1·957	90·6
52	5996	96	1·982	1·963	1·945	1·924	84·0
53	6074	90	1·954	1·943	1·897	1·876	75·2
54	6152	80	1·903	1·922	1·825	1·804	63·7
55	6242	65	1·813	1·901	1·714	1·693	49·3
56	6330	50	1·699	1·880	1·579	1·558	36·1

1 Scale No.	2 Wave-length A.U.	3 Luminosity.	4 Log. of Luminosity.	5 Correction Factor.	6 Sum.	7 Corrected Log. Luminosity.	8 Corrected Luminosity.
57	6423	33	1·518	1·858	1·376	1·355	22·7
58	6520	21	1·323	1·833	1·155	1·134	13·6
59	6621	12·5	1·097	1·808	·905	·884	7·65
60	6728	7	·845	1·783	·628	·607	4·05
61	6839	4	·602	1·755	·357	·336	2·17
62	6957	2	·301	1·725	·026	·005	1·01
63	7082	1	·000	1·695	1·695	1·674	·47
64	7217	(·5)	(1·699)	1·658	(1·357)	(1·336)	(·22)
65	—	—	—	1·618	—	—	—

NOTES.—Figures in brackets refer to Abney's Table 38, p. 239, col. 3. The figure in the third decimal place in the correction factors is only approximate.

in this case to deduct .021 from all the logarithms in col. 6, thus giving col. 7 in the table. In col. 8 the anti-logarithms of the figures in col. 7 are given, these being the percentage luminosities of the different regions of a *normal* spectrum (arc light) expressed in terms of the corrected maximum at λ572 $\mu\mu$ = 100.

These numbers, if plotted against their corresponding wave-lengths, show the curve of distribution of luminosity of the normal spectrum of the light from the positive crater of the electric arc which Abney used. Similar tables and curves may easily be derived from several other series of Abney's experimental data by means of the correction factors given in col. 5 of the above table, and I have worked out several in this way.

It will be observed that the position of maximum luminosity lies almost exactly at the middle of the visible normal spectrum $\left(\frac{\lambda 390 + \lambda 760}{2} = \lambda 575\right)$ and especially that this continues to be true even with a spectrum so enfeebled that most of the red end has become invisible (Abney's Table VI., p. 98). We shall see, too, that the distribution of luminosities on either side of the maximum is nearly symmetrical in both cases.

It would be very interesting to know the curve of luminosities for a number of sources of "white" light *after the eye is fully adapted to each*, for it is well known that the eye readily accepts as *white* any of a wide range of lights, differing considerably in colour from one another, in the absence of a standard of comparison.

Instead of plotting relative *luminosity* values against corresponding wave-lengths, it is more useful to us to plot their logarithms, because the curve so obtained corresponds to eye estimates of relative brightness, just as photographic *densities* (logs opacity) are better than opacities for studying and appreciating the gradation of negatives and prints; moreover, the changes at the feebly luminous deep red and blue ends of the spectrum are more clearly displayed by this method. Fig. 5 shows the two curves of corrected luminosity logarithms corresponding to the data given in Abney's Table IV., col. 4, p. 94, and Table VI., p. 98 (for a feeble spectrum), after modification in the manner already explained. The full figures for the former curve are given in col. 7 of my table above. For these sets of observations the eye was dark adapted.

Several interesting conclusions may be drawn from these curves, for they represent also the relative values of the densities which should be produced by the spectrum of the light of the open arc on a panchromatic colour-sensitive plate which has been corrected by means of a filter perfectly adapted to it. In other words, given any panchromatic plate, what we have to do is to make a filter for it which will so modify the light of the open arc positive pole that the above curve represents the distribution of densities obtained in a spectrogram made on the plate by that light. Further, in the case of a *plate possessing even sensitiveness throughout such a spectrum*, the inverse of this curve gives the absorption coefficients (D in the equation $I = I_0 \times 10^{-D}$) of the required filter for every wave-length merely by re-numbering the ordinates downwards, beginning with zero at the central maximum, as I have done at the right-hand side of Fig 5.

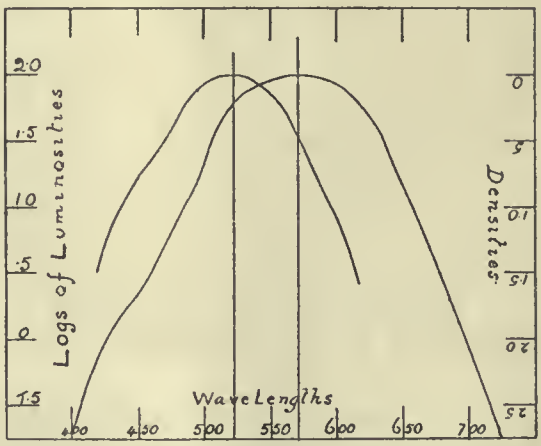


Fig. 5.

Clearly for a uniformly sensitive panchromatic plate a strong green filter is the only one which could lay any claim to be a perfect correcting filter for all colours, and inasmuch as recent advances in the production of panchromatic plates have resulted in the realisation of equal sensitiveness in the red and blue of the spectrum of arc light, with the green not far behind, it is evident that for the best work in monochrome a green filter is now absolutely essential.

Another very interesting application to be derived from such curves is as follows:—In those cases where use of the full correction filter is impossible or thought to be undesirable, it would often be useful to have filters for *observation* purposes which would so modify the relative luminosities of the scene or object to be photographed that the latter appeared in the same sequence of brightness to the eye as the plate, or plate and screen, about to be used will portray them. With approximately monochromatic

filters (*i.e.*, appreciably narrower in their region of transmission than the tricolour filters used in three-colour work), inspection of the scene through the filter to be used will usually be sufficient to give the desired information if the plate shows no insensitive gaps or other marked irregularities of sensitiveness to the spectrum; but where these exist or with *any* plate when a comparatively pale filter embracing a wide region of the spectrum is to be used, such a procedure is most misleading, and the frequently offered advice to use them in this way cannot be too strongly condemned.

If, however, we construct a filter having absorption coefficients

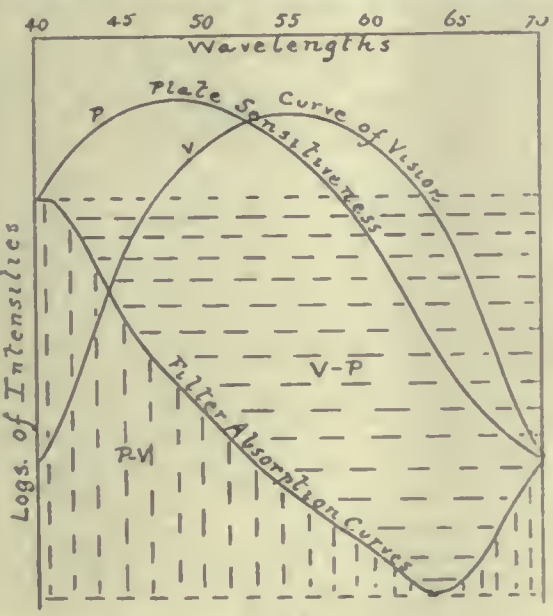


Fig. 6.

corresponding to the inverse of, *i.e.*, complementary to, the perfect correction filter, for any given panchromatic plate, it will reduce the apparent luminosities of every part of the visible spectrum of white light to correspond to the sensitiveness of the plate to the same light. Hence such a filter will so alter the appearance of any coloured scene or object that its apparent tone values will now agree with those which the panchromatic plate would register.

For an evenly sensitive panchromatic plate this will mean a filter having absorption coefficients corresponding with the curve of Fig. 5, or Abney's luminosity curve expressed logarithmically. Obviously, such a filter would have a violet colour complementary to that of the perfect green correcting filter already described. Fig. 6 shows diagrammatically for an imaginary plate the relations which exist between V, the curve of visibility of the spectrum, P the curve of sensitiveness of an imaginary colour-sensitive plate, P-V the absorption curve of the perfect correction filter for monochrome rendering, and V-P that of the viewing filter under discussion, for such a plate as P within the wave-lengths limits considered, viz., 400-700 $\mu\mu$. If such viewing filters were made to correct all colour values fully up to the limits of the visible spectrum they would be too dark for convenient use; further, since action on a photographic plate occurs beyond the visible spectrum in the violet, even this degree of correction would not be sufficient. In practice, however, I find it to be possible for the best modern panchromatic plates to construct filters transmitting sufficient light for convenient observation, and yet capable of serving as valuable aids in judging the order of luminosities which the plates will record. Owing to the slightly inferior green sensitiveness of even the best commercial panchromatic plates, the absorption curve of the observation filter required for them should pass rather less green light than Fig. 5 indicates. The presence of ultra-violet sensitiveness and the absence of sensitiveness in the deep red beyond about λ 720 are best allowed for by passing more blue light as compensation for the former and cutting out the deep red completely on account of the latter fact, so that the required filter will have a fairly deep blue violet or blue hue.

With a properly balanced filter of this kind we can see beforehand what kind of record our unscreened plate would give us, and by adding any desired yellow, orange, or other filter to it can study the effect of such filter on the rendering of the tone values of the scene by the plate. In this way we are enabled with greater certainty to select the filter required to produce any desired tone relationships. I have prepared such filters as are here described both for full correction and for observation purposes, and have pleasure in showing them to-night, but the main object of this communication will have been fulfilled if it serves to direct attention to certain interesting aspects of the problem of rendering colour in monochrome which do not appear to have received much attention hitherto.

F. F. Renwick.

EXAMINATION QUESTIONS IN PHOTOGRAPHY.

[The following are the questions set at the examination held by the City and Guilds of London Institute, in the Ordinary Grade of Photography, Section B—viz., Photo-Mechanical Processes. We have appended answers of a kind which students of this degree of knowledge might reasonably be expected to give. The questions (and answers) in pure photography were given in our issue of June 13.—Eds. "B.J."]

SECTION B. PHOTO-MECHANICAL PROCESSES.

Grade I.

1. You are given the opportunity of selecting and testing before purchase lenses intended for (*a*) making of half-tone negatives, (*b*) making line negatives. Explain exactly what properties you would specify, and how you would proceed to demonstrate whether or not the instruments fulfilled the requirements laid down. (50.)

The same lens is generally used for half-tone and line negative-making. If the lens is to be used entirely for line work there is not so much necessity for it to work at large apertures as is required for half-tone work.

Process lenses must be specially corrected as they are nearly always used for moderate reductions, same size, or enlargements. The wet plate process being used very extensively for line and screen negative, and this method requiring an excess of blue and ultra violet rays to secure quick exposures, the glass employed in the construction of these lenses must be transparent to this portion of the spectrum of white light. The focus of the lens should be somewhat long, otherwise the oblique rays towards the edge of the plate may interfere with the correct dot formation. The process lens should give critical definition at full aperture over the size plate it is stated to cover, and be free from spherical aberration, shown by the detail at the edge of the negative being in focus as well as that in the centre; also from distortion, shown by straight lines on the edge of the field being reproduced straight. It should be free from the oblique aberration of coma and radial astigmatism which is shown by the marginal portion of the field being correctly and sharply defined; also free from chromatic aberration, the coloured images of white light being sharp and in focus at the same time. To examine the lens for these defects a test object should be made of a number of squares ruled on white paper, and this test object be focussed up to various sizes and the image inspected to see if any changes take place in the image when the stop is reduced, that the definition is equally good all over the plate, and that all straight lines are reproduced as straight. A few wet-plate negatives should be taken to ascer-

tain that the reproduction is as sharp as that shown on the ground glass.

2. Why is it necessary, in the first instance, to make an ordinary photograph from an object in relief when it is desired to illustrate that object by means of the ruled screen half-tone processes? Your answer must be in detail and not merely generalities. (5.)

The half-tone process reproduces as a very flattened scale of gradation. An object in relief presenting an extended and steep scale of gradation, it is necessary first to obtain an ordinary photograph of a relief object in a somewhat flattened scale to enable the correct dot formation to be secured in the screen negative.

3. Name some of the substances which have been proposed for use and have actually been used in the making of filters for correcting the undue blue sensitiveness of the ordinary dry-plate of commerce. (15.)

The following dyes or chemicals can be used: picric acid, bichromate of potash, Auramine, Naphthol Yellow, Tartrazine, Flavacine T., and Yellow filter A.

4. What is the object of the preliminary graining of the zinc plate prior to coating it with bichromated colloid for zinc line printing? (15.)

To give a porous surface to the zinc which will hold grease or water, and also to enable the sensitive solution to be flowed evenly over the plate and give a grip to it when dry.

5. Given two nap leather rollers as they come from the makers, state how you would prepare them as "starting" and "finishing" rollers, respectively, for line relief etching. (30.)

One method of preparing a new nap roller is as follows:—First indicate on the handle the direction of the nap and thus make sure that the roller is always scraped with the nap. Roll into the skin Russian tallow and allow to remain until absorbed. When absorbed, roll up with equal parts of tallow and mid-litho varnish, gradually increasing the varnish until all varnish is used. Scrape well, and then apply equal parts of varnish and ink, increasing the quantity of ink until all ink is used. Give a good scraping, and the roller is ready for use. At first it is as well to only use it on coarse work.

A finishing roller is generally an old litho roller with the nap worn off. Before being used it is rubbed down smooth with sand-paper and finally polished with the hand.

6. What is meant by "direct" photo-lithography as against "transfer" photo-lithography. Describe in detail one method in each process. (50.)

Direct photo-lithography is the process in which they greasy ink image is obtained by printing on a bichromated albumen film held on a special zinc or aluminium plate, through a reversed line or half-tone negative. In the transfer process the greasy image is secured by printing through a direct negative on to a bichromated gelatine film supported on paper. The ink image is then transferred either to stone or metal. The advantage of the latter process is that the actual greasy image comes in contact with the litho stone or plate; whereas in the former method of working the image has a thin film of albumen between it and the metal.

The following is the method of working the two processes. Zinc plates for the direct process are supplied especially grained, and before coating are placed for a few minutes in a cleansing bath of water, 20 ozs.; nitric acid, 1 oz.; and alum, 2 ozs.; after which they are removed and placed under water and swabbed over with a tuft of cotton-wool. A plate is then ready to receive the bichromated albumen which is made up of the white of one egg, or 75 grains of dried albumen; water, 20 ozs.; fish glue (Le Page's), 11 minims; bichromate of ammonia, 130 grs. This solution is well beaten up and the froth allowed to settle, and then carefully filtered. The metal plate is fixed on a special whirler and the sensitive solution poured on and quickly whirled, and then dried by gentle heat. It is then exposed under the negative in a pneumatic frame to a strong actinic light. After exposure it is rolled up with a special photo-litho ink and the plate placed under water, and then carefully rubbed over with a tuft of cotton-wool. The portion where the light has struck the ink will be retained; on the other portion it will wash away, leaving a greasy image of the original on the plate. The plate is then gummed up, dried, and is then ready for the prover.

In the transfer process some special photo-litho paper is required, which is sensitised in a 2½ per cent. solution of bichromate of potash, made light yellow by the addition of ammonia. The paper is left in this sensitizing bath for three minutes, it is then withdrawn and squeeged on to glass or a ferrotype plate to give a glazed surface. The exposure, rolling up, and developing, is the same as for the direct method. After development the transfer is dried, and is then ready for the transferer.

7. Name the substances which can be used for producing an image on zinc suitable for line relief etching. Which process is considered to be the best, disregarding the elements of time and cost? (30.)

The substances used for producing an image on zinc for the line relief process are—sensitive bitumen, bichromated fish-glue and bichromated albumen. The bichromated albumen is the best and quickest for the general run of work.

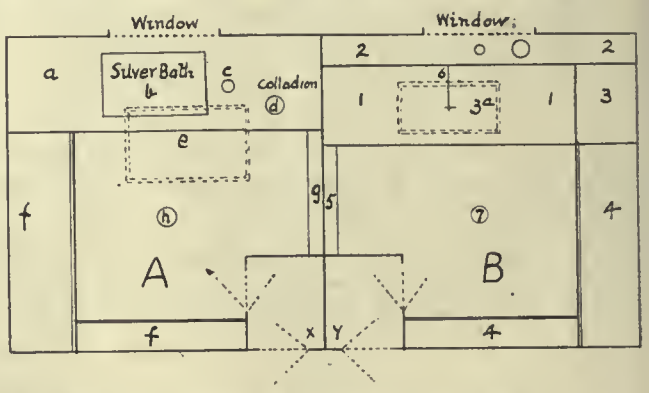
8. State the differences between the kinds of dry plates which can be used for making negatives of line drawings. What essentials must a plate fulfil to be suitable for the work? (30.)

The difference between the dry plates used for process is, that the ordinary process plate is chiefly sensitive to the ultra-violet and blue rays of white light, and the panchromatic process plate to all colours of white light. A process plate must be capable of giving great density coupled with fine grain and thin film. In those known as "half-tone" plates the thin film is very necessary.

9. Give a simple sketch of the arrangement and specify the equipment for (*a*) a sensitising room, (*b*) a developing room for wet-plate work. (60.)

A.—Plan and Equipment of Wet Plate Sensitising Room.

(*x*) Entrance lobby, with two swing doors opening both ways to enable the operator to enter room without admitting light.



(*a*) Table for silver bath and collodion bottle and filter.

(*b*) Silver bath.

(*c*) Small hole through table to support glass funnel when filtering bath, the bottle in which bath is being filtered is under table.

(*d*) Collodion bottle and draining bottle.

(*e*) A large yellow safe-light is hung from ceiling of room, 7 to 8 feet from floor.

(*f*) Tables to hold dark slides, having shallow ledge to prevent dark slides slipping down. Two or three drawers should be fitted to these tables in which can be placed blotting paper, bath hooks, etc.

(*g*) Ledge or shelf.

(*h*) Electric lamp suspended from ceiling.

B.—Plan and Equipment of Wet Plate Developing Room.

(*y*) Entrance lobby as for A.

1. Large sink made of teak wood or porcelain.

2. Ledge or shelf over sink to hold developer bottles and pouring cup.

3. Shelf over sink to hold fixing bath, or bottle containing fixing bath.

3*a*. Safe-light suspended over sink at such an angle to enable operator to follow flow of developer.

4. Tables for dark slides with projecting edge.

5. Shelf for bottles, etc.

6. Tap which projects well over middle of sink to enable negatives to be handled without knocking back of sink.

7. Electric lamp suspended from ceiling.

General remarks. The dark rooms should be painted black or terra cotta colour, and be well ventilated with light trap ventilators, both top and bottom of room. The windows are glazed with a special orange glass or fitted with a frame on which is stretched orange fabric.

All tables should be well varnished with a chemical-resisting varnish.

10. What is the object of supplying a substratum to glass for wet collodion negative making. What materials are used for the purpose. (15.)

The object of applying a substratum to the glass used for the wet collodion process is to hold the collodion film on the glass and prevent it stripping off when placed in the silver-bath; also, when the glass has been cleaned, and then substratumed, it can be stored and is always ready for immediate use. Albumen, gelatine, and, sometimes, a thin solution of India rubber dissolved in benzole are used.

11. What are the principal conditions governing the sensitiveness of the coating prepared by means of a bichromated fish-glue mixture. (50.)

The conditions governing the sensitiveness of the bichromated fish-glue film are: that the bichromate of ammonia used in the glue should not exceed 6 per cent.; that the glue be free from acidity and impurities; and that the film is dry and not coated too thickly.

12. Describe the means which are available for producing a facsimile of the effect of a line drawing by the line relief process when the original shows varying depths of tone in the lines constituting the drawing. (30.)

The following is a method of obtaining a reproduction of a line original showing varying depths of tone in the lines. A negative is made through a fine screen or Metzograph screen, aiming to eliminate the dot effect in the black lines, and retaining a small hard dot in the grey lines, and a strong join in the high-lights. The negative is printed by the enamel process on zinc and burnt in, full exposure being given. The print on metal, if correctly exposed, should show the strong lines as a solid, the grey lines with a dot or grain effect, and the white minus a dot or only a very fine one. This print on metal is etched so as to obtain depth and correct tone in the grey lines, after which it is treated as a line etching, any dots showing in the whites being etched away. After mounting, the metal plate is carefully routed to eliminate any portion of the plate representing the white card or paper of the drawing, otherwise these parts are liable to print up in the resulting proof.

Photo-Mechanical Notes.

Photo-Engraved Advertising Novelties.

Do engravers get their proper share of the business in manufacturing the advertising novelties that are so constantly in demand? Photo-engraving is especially suitable for making the placards shown on shop counters, on the walls, and in the windows, but most of this work is pure lithography and does not have the faithfulness that photo-engraving would have. Package goods, bottles, and small objects carefully reproduced and printed in colour, two, three or four colour, look extremely attractive and the colours used often need only be flat tints. Such jobs as these, however, should be undertaken by the engraver in conjunction with a good printer, and the job quoted for as a whole, to include the delivery of the finished work.

Etching of designs in the same way as name plates can provide a great variety of novelties such as rules, penknife handles, backs of blotters, ash trays and so on, and brass or nickel-silver is just as easy for the engraver to etch as his familiar zinc or copper, so that the only thing he has to learn is to fill in the design properly.

There is also a field for enamels, the metal being etched from a design and the powder enamels being filled in the etched hollows and fused in the furnace, though, perhaps, this is rather a long way away from the ordinary routine of the engraver. However, the making of prints on metal and their nice mounting is nearer home, and some excellent advertisements have been made in this way. For example, a neat line drawing with a black sky and black street has been made of a place of business. This is photographed and an ordinary line print made on aluminium, dusted with bitumen, heated until glossy, varnished with transparent varnish, and mounted on a piece of bevelled mahogany and provided with a support. The finished article is a charming novelty at very little expense. Or if you desire to show tone, any photograph can be used, a half-tone positive made, and this etched so that you have an intaglio print. The hollows are now filled in with japan or other suitable black, and you have a permanent and attractive advertisement. This field should be decidedly worth cultivating

Reproduction of "Matt-Surface" Originals.

Every half-tone engraver—or, indeed, anyone making copies—knows the difficulty of reproducing satisfactorily matt-surface copies, a difficulty which is increased when the colour of such originals happens to be sepia or brown, as it so often is. The result is usually of a peculiarly disagreeable "graininess," to which the customer very much objects. This is caused by the scattering of the light due to the matt surface. It cannot be minimised very much by the use of elongated stops, as roughness in the picture itself apart from the surface may be; and the only thing to remedy it is to treat the surface so as to do away with the light-scatter.

The writer has found a very satisfactory way to varnish the print with a waterproof varnish (called in the U.S.A., "Kodalak"), applied to the print just as collodion would be flowed over. A thin celluloid varnish would no doubt do as well, though probably not for prints made on matt collodion paper. The drawback to this method is that the print is permanently "de-matted," so to speak, and if the customer objects to this, some other means must be found. The most satisfactory is the use of glycerine, which can afterwards be removed with a little water—when the print will dry up as it was before treatment. The best way of using this method is to flow the print and then squeegee the print into contact with a piece of plate glass, being careful to squeeze out all air bells. Encaustic paste may also be used, but this has the disadvantage of the varnish in being difficult to remove, and also is somewhat difficult to apply evenly and free from streakiness and lint.—A. J. N.

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Applications June 2 to 7:—

Cinematography.—No. 14,101. Cinematograph apparatus. T. M. Down

Photographic Apparatus.—No. 14,431. Photographic apparatus. R. T. Lang.

Colour Cinematography.—N. 14,132. Preparation of cinematograph films and projection of motion pictures in colours therefrom. L. O'Malley.

COMPLETE SPECIFICATIONS ACCEPTED,

These specifications are obtainable, price 6d. each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

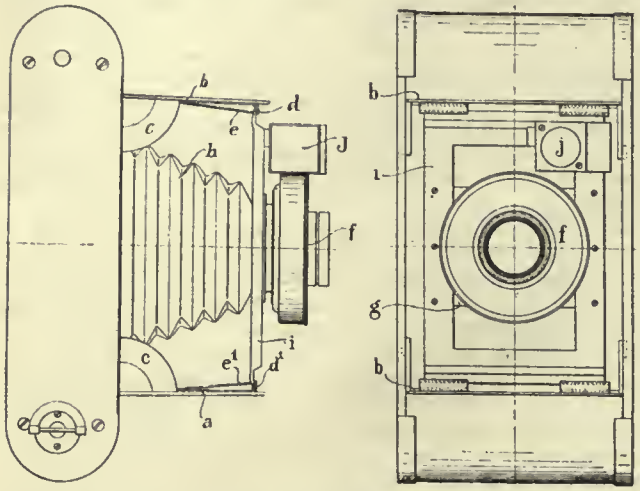
The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

Folding Cameras.—No. 125,818 (June 13, 1918). The door or closure piece through which the lens projects when in its extended position is divided into two hingedly mounted parts opening away from one another, the amount of opening movement of each part being limited. There is a stop piece upon each door and one or more spring clips adapted (when one end of a plate-like part supporting the lens and the front end of the camera bellows is brought against one of the stop pieces) to yield and allow the other end to be brought against its stop piece, when it rises to engage the rear side of the plate and hold it in position against the stop.

In the drawings the door or closure piece for the aperture in

the camera body through which the lens and bellows project when the latter are extended is made in two parts *a*, *b* hingedly mounted so as to open away from one another, curved arms *c* limiting the opening movement of the doors. Each door carries one or more stop pieces *d*, d^1 at its outer end and one or more plate springs *e*, e^1 project adjacent to said stops.

The lens *f* and front end of the bellows *h* are carried in a member *g* acting as a slide (for adjustment purposes) within a front plate *i*, which is brought into its correct position for use by placing one end between, for example, the stop *d* and plate spring *e* on the door *b* and then using that end as a fulcrum whilst the other end is turned to a corresponding position, the spring e^1 at the free end being displaced until the plate abuts against the stop d^1,

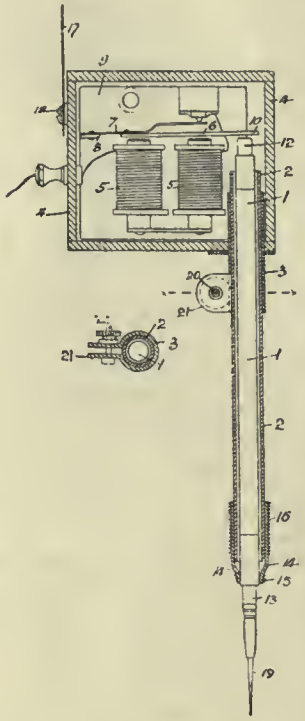


when it rises at the rear and bevelled edge of the plate and prevents its withdrawal, unless the spring is displaced by hand when it is desired to return the bellows to their folded condition. The plate *i* may be adjusted from side to side of the camera by sliding it between the springs *e*, e^1, and stops *d*, d^1 and the lens be adjusted by moving the plate *g* in the plate *i*. The latter may carry the finder *j* or this may be attached to the lens.

If desired, the one door may have a groove only therein which serves as a stop and holder for the one end of the plate *i*, whilst the other door has the spring *e* and stop *d* as herein described. Suitable spring catches hold the doors in their closed positions. —Samuel Poole Twemlow, Springfield, Sandbach, in the County of Chester, engineer.

Electric Retouching Pencils.—No. 125,832 (June 28, 1918). A lead pencil or other suitable pencil is loosely mounted and carried in a tubular holder at the top of which there is a box or casing containing an electro magnet with an oscillating armature which is electrically oscillated by the electro magnet. The top end of the pencil is so situated relatively to the free end of the armature as to be struck thereby, but in order that the blows from the armature on to the pencil may be muffled an indiarubber cushion is introduced and fixed on to the top of the pencil or on to the end of the armature, and in addition to this the lower end of the pencil which projects through the tubular holder is supported by a spring which permits of the necessary slight and rapid longitudinal oscillations of the pencil in the holder.

In carrying the invention into practice an ordinary lead pencil 1 of the refillable type is employed, and is mounted loosely in the tube 2, forming a tubular holder, the upper end of which tube fits in the tubular clip 3, which is fixed to the bottom of the case 4, containing the electro magnet 5, which is arranged with its axis parallel with the axis of the pencil. This electro magnet is suitably connected to a battery, and is combined with an ordinary make and break device in the case 4 and the oscillating armature 6, arranged at the top of the electro magnet, one end 7 of the armature being fixed to the bracket 8 of a back plate 9, on which the electro magnet is fixed. The free end 10 of the armature is situated over the upper end of the pencil, 1, which latter is fitted with an indiarubber cushion block 12, adapted to be struck by the armature so that the vibrations of the latter will be muffled and transmitted to the pencil 1, but in a smaller degree. The lower end 13 of the pencil projects through the bottom of the tubular holder 3, and is there secured for rapid longitudinal vibrations by means of a spring, which is preferably formed of a strip of thin indiarubber 14, which at 15 is bound on to the projecting lower end of the pencil, and also at 16 is bound on to the end of the tubular holder 2, so that this indiarubber spring supports the pencil in the holder, with the indiarubber



block on the upper end of the pencil at the proper distance from the free end 10 of the oscillating armature 6.

When using the electric pencil above described it is preferred for the case 4 to be suspended, as at 18, from some overhead point by a cord 17, combined with a short length of indiarubber acting as a spring suspension piece adapted to relieve the weight of the box and its contents on the user's hand. The best results on the negative can be obtained by using a moderately hard lead 19 in the pencil, and with a fine point on which the muffled vibrations are so small as to be almost invisible to the naked eye.

The intensity of the vibrations on the pencil caused by the armature can readily be adjusted by sliding the tubular holder 2 in the clip 3, so as to cause the indiarubber block 12 on the top of the pencil to be slightly nearer to or farther from the armature 6, this clip 3 being furnished with a set screw 20, passing through the two ears 21 of the clip, by which the latter can be tightened or slackened on the tubular holder 2.

It is found that the arrangement above described acts well in practice, but if desired in addition to or instead of the indiarubber block 12 being fixed on the top of the pencil 1, there may be an indiarubber block fixed on the outer end 10 of the armature 6 to strike the pencil and form the muffled vibrations.—William Henry Franklin, 5, Castle Street, Dudley, Worcestershire.

Photographers Scarce.—At an inquest at Lambeth on Saturday last, on the body of an unknown man found in the Thames, the coroner asked whether the police had had the man photographed, and was told that it would take 24 hours to get a photographer. The coroner said that a photographer ought always to be available, adding that photographs were not taken as scientifically as they might be.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

SATURDAY, JUNE 21.

Chelsea Photographic Society. Affiliation outing in Croydon district.
Liverpool Amateur Photographic Association. Outing to Pool Hall, near Hooton.
Manchester Amateur Photographic Society. Outing to Poundswick.

MONDAY, JUNE 23.

South London Photographic Society. "Working up the Negative and Print" E. W. Taylor.

TUESDAY, JUNE 24.

Hackney Photographic Society. "Hints in Composition." H. Lamplough, sen.
Manchester Amateur Photographic Society. "Woodland Photography. J. D. Berwick.

THURSDAY, JUNE 26.

Hampshire House Photographic Society. "Garden Portraiture." S. Taylor.

CROYDON CAMERA CLUB.

THE informal session began last week, Mr. E. Cahen giving a lecture on "Cordite," in the production of which he was actively engaged during the war. Many things contributed to the suppression of the Hun, but even the most earnest advocates of home-grown potatoes as a means towards victory would admit that cordite occupied a useful niche of its own.

Briefly, the manufacture of cordite can be divided into three main parts: The making of the gun-cotton; the making of the nitro-glycerine; and the combination of the two. As is well known, the first is made by treating cotton with mixed nitric and sulphuric acids. The product is boiled and washed many times to remove last traces of acid, otherwise it might explode before utilisation in the required direction, which would be disappointing. It is then pulped and dried. The second element is made by nitrating glycerine with great care in cold, well-stirred solution with the same acids, and is then washed with water and dilute soda, and stored in lead tanks.

Weighed amounts of nitro-glycerine and gun-cotton are first mixed by hand and then transferred to incorporating machines, where acetone and a little mineral jelly (vaseline) are added. The resulting paste is pressed through dies of suitable sizes, and the finished cordite is cut into lengths to suit the guns for which it is required, and finally dried.

In a cordite factory, he said, the words "sulphuric acid" and "nitro-glycerine" are seldom heard, being respectively referred to as "cream" (owing to its oily look) and as "the oil." Recovery of the acetone and acids is a strong feature, as upon this depends the commercial success of the factory. The latter in general appearance looks like a waste of sandhills dotted with separated small houses, and lined with miles of steam piping. Two areas are divided by danger-gates, and striking matches, etc., in the danger area is not appreciated.

In the discussion it was cheering to note that no topic of whatever nature comes amiss to the members. Mr. Purkis, apparently approaching the subject for the first time, and, therefore, not being bound by conventional ideas, suggested several important improvements in procedure. Cordite, being essentially an element whose virtue is dependent upon the liberation of gas at the psychological moment, naturally attracted Mr. Harpur, who waxed eloquent on "teasing the cotton." Why cotton should be teased he failed to explain, but this led Mr. Ackroyd to ask whether an early drop in price of sewing cotton might be expected, but the lecturer knew not. Those who are more or less compelled to sew buttons on their own unmentionables can only live in hope that the perilous economy of material obligatory in these days may be relieved in the immediate future. A most hearty vote of thanks was accorded Mr. Cahen, proposed by the president, who paid a tribute to the excellence of the photographs taken by the lecturer, many under extremely difficult conditions.

TYNESIDE PHOTOGRAPHIC SOCIETY.—Under this title a photographic society at Newcastle has been formed, open to both sexes. The subscription fee is 10s. 6d. for seniors and 5s. for members under 21 years of age. A progressive programme has been outlined for the summer and winter sessions. The hon. secretary is Mr. J. Nichol, Dial House, Newcastle-on-Tyne.

Commercial & Legal Intelligence.

NEW COMPANIES.

P. F. PERRY AND CO., LTD.—This private company was registered on June 6 with a capital of £4,000 in £1 shares. Objects: To enter into an agreement with P. F. Perry, and to carry on the business as manufacturers of and dealers in photographic and scientific apparatus. The subscribers (each with one share) are:—P. F. Perry, 11, Church Street, West Hartlepool; R. W. Hudson, 15 South Road, West Hartlepool, company adjuster. Directors: P. F. Perry and R. W. Hudson. Registered office: 11, Church Street, West Hartlepool.

NAVANA, LTD.—This private company was registered on June 5 with a capital of £10,000 in 9,500 10 per cent preference shares of £1 each and 10,000 ordinary shares of 1s. each. Objects: To carry on portrait and general photographic studios. The subscribers (each with one preference share) are:—A. Bennett, 67, Wokingham Road, Reading, photographer; T. B. Kitson, 72, Albion Street, Leeds, solicitor; A. E. Walsham, 60, Doughty Street, W.C., photographer. Directors: A. Bennett, T. B. Kitson and A. E. Walsham. Registered office: 60, Doughty Street, W.C.1.

News and Notes.

PHOTOGRAPHING THE AIR.—Photographs showing air in motion across the wings of an aeroplane, taken with a moving picture camera equipped with a recently invented device, were put in the hands of Mr. Crowell, Assistant Secretary of War, just before he sailed from New York for Europe. The photographs were made in a series of experiments with army aeroplanes, and are expected by officers to prove of value in designing and operating aircraft.

"PUNCH" has discovered the following in the "Transactions" of a photographic society:—

"Mr. — stated that as Architectural Photography covered a large and varied field he purposed to confine his remarks to the line of work most familiar to him, namely, The Interior of some of the great English Ministers."

This leads "Punch" to comment:—

"Now at last we shall know if the Government's heart is in the right place."

THE OPTICAL BRANCH of the Ministry of Munitions has been transferred to the Board of Trade, and the latter will deal with questions of assistance to, and organisation of, the optical scientific instrument, glass, and potash industries, including administration of the Glass Control (Consolidated), Clinical Thermometer, and Potassium Compound Orders. All communications relating to such questions in future, therefore, should be addressed to the Assistant Secretary, Board of Trade, Industries and Manufactures Department, Scientific Instruments, Glassware, and Potash Production Branch, 117, Piccadilly, London, W.1.

PHOTOGRAPHY AND THE RETAIL BUSINESS LICENSING ORDER.—In reply to an enquiry addressed to the Controller of Retail Business Licence Order we have received the following information which, we trust, will be useful to many of our readers.

"I am directed to inform you that no licence is required for the four branches of photography mentioned. If it is desired, however, to sell frames or photographic accessories a licence will become necessary. The above ruling applies uniformly throughout the country (Ireland, which does not come under the Order, excepted)."

The four branches referred to are:—1. Photographic portrait studio. 2. Photography away from the studio, of various subjects such as landscapes, machinery, etc. 3. Portraiture at sitters' homes or in public places, for example, on Hampstead Heath and other pleasure resorts. 4. Retouching of negatives.

CONTINUED RATIONING OF COAL, GAS, AND ELECTRICITY.—The Controller of Coal Mines announces that it is found necessary to continue the rationing of coal, gas, and electricity for household fuel and lighting for a further period. It is, however, proposed to modify the present order to the extent that consumers of less than 5 tons of coal in the year, 12,500 cubic feet of gas in any quarter,

400 B.T.U.'s of electricity in any quarter, will not be subject to assessment. They must, however, be registered with their coal merchants for the supply of coal.

A revised Order, which will take effect from July 1st next, will be issued during the present month. In the meantime the following memorandum is issued for the information of the public.

1. Anthracite, coke and patent fuel will be exempted from the Order for the time being.

2. All consumers of coal must register with coal merchants for their supplies. Present registrations will be valid unless notice to the contrary is given by either consumer or merchant.

3. The present assessments are current for a year from various dates commencing with October 1st, 1918. In the case of consumers over the quantities named above, the assessments will be renewed for the same annual quantity for 12 months from July 1st, 1919, and the balance of the old assessments cancelled.

4. New certificates will be issued to all present holders of certificates for the 12 months' supply, and it will not be necessary to make application for the certificates, except in the case of new consumers or of those who, owing to a change in the basis upon which the original assessment was made, desire a modified assessment.

5. The new assessments and certificates will date from 1st July in order to enable private consumers, so far as coal may be available, to stock on account of the coming year's allowances. Immediately on the issue of the new order, arrangements will be made to enable this to be done during the months of July, August, and September.

6. The supply of fuel already made under any existing certificates in respect of the period subsequent to June 30th will be treated as a supply on account of the new year's allowances.

7. The conversion equivalents of gas and electricity in terms of coal will be fixed at:—18,750 cubic feet of gas to the ton of coal; 1,000 B.T.U.'s of electricity to the ton of coal.

8. The control of maximum prices for the sale of coal will be rigidly enforced.

9. In order to simplify some of the machinery and provisions of the present Order, the special Local Fuel and Lighting Committees will be discontinued, and, in the ordinary course, the control of the Local Fuel Overseer will, subject to the directions of the Controller, be left to the local authority—except in the Metropolitan Division, which will continue under the immedate supervision of the Household Fuel and Lighting Branch of the Coal Mines Department.

Economy in the consumption of coal still remains vital to the national interests. If the output of coal in the near future will allow a relaxation of those restrictions, the Local Fuel Overseer will be authorised, from time to time, to receive applications for such increased allowances as any increase in the supplies of coal may justify.

Correspondence.

**** Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

**** We do not undertake responsibility for the opinions expressed by our correspondents.*

PHOTOGRAPHERS' ANNUAL HOLIDAYS.

To the Editors.

Gentlemen,—I am pleased to inform you, that the Londonderry professionals have agreed without exception to close down their studios for August Bank Holiday week. This is the second year of the innovation, and the eagerness shown by each and all fellow professionals for continuation of the scheme well repaid the little trouble spent in going round.

Surely most small provincial towns could do the same if one man would make a round of his fellow professionals and induce them to start a similar scheme. My advice is try it, we are not such a bad lot when we meet.—Yours faithfully, E. G. Harries.

THE LONDON SALON OF PHOTOGRAPHY.

To the Editors.

Gentlemen,—In view of the forthcoming Salon of Photography may I draw attention to a small detail in the hands of the Selection Committee which in my opinion calls for alteration? As all exhibitors know, their accepted and rejected prints in passing before the Committee are scored on the back with the welcome A and less welcome B and C, together with figures concerning the cataloguing of the same. Of recent years since framing has been abolished the black chalk with which this is done occurs on the back of the prints or mounts themselves. When these are placed on the top of each other in the processes of rejection, storing or repacking, the chalk may, and all too frequently does, transfer itself to the surface of the print to which it lies in contact. When this is a delicate bromide print the effect is often to do serious damage, since the chalk is extremely difficult to remove, even with rubbing under water, and even when this remedy is successful, as far as the chalk is concerned, it has the disadvantage of removing any hand work upon the print, even if it does not remove the emulsion!

I am sure this point has only to be realised to be easily corrected either by marking with a different material or by placing thin paper between the prints.—Yours faithfully,

An Exhibitor.

STEREOSCOPIC PHOTOGRAPHY.

To the Editors.

Gentlemen,—The concluding paragraph of the article on "Stereoscopic Photography" in the June 6 issue of the "B.J." tends to convey a wrong impression, to which C.E.B. will, no doubt, be glad to have his attention drawn.

The idea in your contributor's mind is to make large size negatives and then reduce them to obtain improved apparent definition at the normal interocular separation. He suggests that these large pictures should be taken at "a view-point separation of 4 ins. to 6 ins"; the assumption being that the subsequent reduction would cause the consequent relief to be correct. This assumption, however, is wrong; no matter what the size of the picture may be, providing the relief required is normal, the separation should not exceed that needed for the ordinary stereogram.

Perhaps C.E.B. will give his opinion on this matter for the benefit of readers who, like myself, have read his most instructive article with the greatest interest.—Yours faithfully,

H. J. Mobbs.

41, Ravenscourt Gardens, W.6.

[Mr. Mobbs is perfectly right, and I am obliged to him for calling attention to the point. The view-point separation should be the same for two half plates as for the direct stereogram if the normal separation is to appear in the reduction. It is, of course, recognised that for special subjects involving distant objects it is often permissible and advantageous to increase the view-point separation beyond the normal, but this applies as much to direct stereograms as to large photographs that have to be reduced.—C.E.B.].

ASSISTANTS' WAGES.

To the Editors.

Gentlemen,—The letters of "Assistant" and "An Employer," which have appeared in the correspondence columns of the Journal of May 30 and June 13 respectively, are, to say the least, interesting.

I will go a little higher than "Assistant" and say that £3 per week for capable and competent workers, which has been offered in recent issues of the "B.J.P.," is an inadequate wage. This is less than 30s. according to pre-war value. How can employers expect capable and competent workers to take a real interest in their work for a wage which barely assures them an existence?

Assistants—like employers—are only human, and is it natural to expect assistants to put any heart in their work from which they derive no pleasure?

We read in our daily papers of street sweepers and lamplighters getting 64s. and 74s. per week (good luck to them). Probably we shall be told this includes war bonus. But isn't the assistant worth a war bonus, seeing the cost of living is still on a war-basis?

Many of us have done our bit overseas, and instead of finding conditions better when we come back we find them comparatively

worse. If this is the result of the war it is time we had another war—at home.

We also know that the "war product" is a "wash-out." Employers will also find this out during the next few months. Probably some have already found it out.

In the last report of the P.P.A. Council meeting Mr. Read is reported to have remarked that it should be made known to parents of the bright prospects and good appointments to be had in the profession. This was said 20 years ago. But how often are parents told that many of these "good appointments" include Sunday work? And at the present rate of wages one sees offered there doesn't seem to be very much "good" about them.

With regard to "An Employer," it is rather refreshing to find one who is willing to give a useful hint or two, and I hope "Assistant" will accept the offer and benefit thereby. And if "An Employer" cares to extend his offer, you are quite at liberty, gentlemen, to forward the address of yours faithfully,

ANOTHER ASSISTANT.

To the Editors.

Gentlemen,—In contradiction to "An Employer," whose letter appears in June 13 issue on the above subject, let me say that I do not "doubt," but that I have ample proof of a number of firms trying to get competent and capable men for quite as little as the £2 a week quoted by "An Assistant" in his letter of May 30, "B.J." p. 303. The trouble is that these employers do not want "war products," but efficient men at war product prices. I certainly consider the glut of incapable assistants responsible to a great extent for this order of things, since men who are out to learn something at an employer's expense are ready and willing to offer their inferior services for what sounds a small salary, and this debars the man who sets a proper value on his professional knowledge from getting a berth until he is so hard up that he is forced to accept a smaller wage than he ought to receive, with the result that some lucky employer gets the benefit of his brains, and should this assistant die or leave, the employer wonders how it is he gets such a lot of "duds" before he picks up another like him at the price.

Now for the particular sentence which causes me to write this letter. "An Employer" says, ". . . I doubt if actual promises were made by any employers to keep places open for patriotic assistants, unless in a few rare and exceptional cases." Whatever has prompted any sane man to pen such a statement? Does he read the advertisement columns of his "B.J" at all? If so, I presume all the firms who tell us they can get on with business as usual now their old staffs are "demobbed" and back at work again are all liars! At any rate it seems clear that "An Employer" is not one of the few rare and exceptional cases himself.

Before he makes any more of these weak remarks let "An Employer" ponder over the following:—"Another Employer" at the outbreak of war enlisted in the ranks with his men, and fought and bled with them; and since demobilisation, six weeks ago, has hastened to re-instate those who have not made the great sacrifice, and he does not consider himself either a rare or exceptional case, although he admits he made no actual promises to his men, for fear an iron ration from Fritz would prevent him from fulfilling them.

I won't question how many operator-retouchers at £5 a week "An Employer" has on his staff, but perhaps he will inform us how many printers and assistants he employs, and what he pays them! If any operator-retouchers who have been unable to find £5 a week berths have not spent all their War Gratuity in stamps looking for a job, perhaps some of them may care to consult "An Employer," because I am sure he must be in a better position to advise them than the unfortunate two pounds a week people he offers to give hints to.

Let "An Employer" think again, and perhaps he may realise that operator-retouchers are not general assistants who must be able to do anything (including operating and retouching), and that it is these men upon whom so many businesses depend, and who are generally paid so much beneath their actual worth; and if he has any hints to offer concerning them, let him publish them through the same splendid medium he has made such rash statements in, and thus earn the gratitude of assistants who ask a fair wage, and employers who are in the profession for more than mere money.

Yours faithfully, ANOTHER EMPLOYER.

June 16, 1919.

Answers to Correspondents.

SPECIAL NOTICE.

In consequence of general reduced supplies of paper, as the result of prohibition of the importation of much wood pulp and grass, a smaller space will be available until further notice for replies to correspondents.

Moreover, we will answer by post if stamped and addressed envelope is enclosed for reply: 5-cent. International Coupon, from readers abroad.

The full questions and answers will be printed only in the case of inquiries of general interest.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

R. W. D.—No effect is produced upon the cards by using rubber gloves. We know of no better way of protecting the hands.

J. M.—Cards such as you require are made in various processes and in large quantities by Messrs. Hood and Co., Sanbride Works, Middlesbrough.

E. H. N.—The vignetter you have in your mind is evidently the "Bram" made by Messrs. Wahltuch Smith and Co., Ltd., 30, Chapel Street, Salford, Manchester.

J. H.—1. It is not necessary for the backing to be dry, but it is advisable to put a piece of brown paper between the plates to prevent the spring on the partition from scratching off the coating. 2. Brush out with a dry shaving brush and then wipe over with a slightly damp cloth.

E. T. C.—There is no book on tank development. Broadly, the method is to dilute the developing solution, as used for dish development, with water so that development takes from 15 to 20 minutes. It may be necessary, with many formulæ, to make up the stock solutions with an extra proportion of sulphite in order to avoid stain in the tank-developed negatives.

E. B.—Blisters such as appear on your films are often caused by a change in temperature and also density of liquid. If a plate or film is transferred from a warm, rather strong, hypo bath to cold water the blisters are likely to occur; in the weather we have been having solutions become warm. The fogging may also be due to a high temperature in the dark room. We have seen several cases of this lately.

H. B.—We do not recommend putting the half-watt lamps into the circular reflector as they will be then in too much of a bunch. We think that five 1,000 c.p. lamps will be quite sufficient, and you might fix three of these along the beam and two on a cross bar the same height running across the studio so that one is nearly opposite to the centre of the background. This bar should be about 7 ft. from the background.

N. W. T.—We are afraid there is no method of focussing with a full aperture. These lenses are not very highly corrected, and you cannot depend on getting critical definition by focussing at full aperture and exposing with a small stop. The best thing you can do is to use a good magnifying eye-piece for focussing—for example, a Ramsden eye-piece as sold by Messrs. James A. Sinclair, Ltd., 54, Haymarket, London, S.W.

R. W. D.—Unless the business is carried on in the names of yourself and your partner you require to register it. In this case you should apply to the Registrar of Business Names, 39, Great Russell Street, London, W.C.1. The cost of registration is 5s., and you will have to put the names of yourself and your partner on your business stationery, but you need not put them on mounts or post-cards nor display it on the front of the premises.

VOX.—The retouching medium can be removed by rubbing with pure turpentine and a clean rag. It is necessary to do this thoroughly, and a second application is advisable; the negative may then be reduced or intensified as usual. The pencils used for working on

enlargements are the ordinary chalk or carbon pencils, or Conte crayon will do if the pencils cannot be obtained. The spots on the gaslight prints are probably due to minute air bubbles. Swab the print over with a pad of cotton-wool the instant it goes into the developer.

E. L. J.—Provided the photographs were taken to the sitter's order, and the usual rates of payment made, then the copyright belongs to the sitter, who can do what he likes with the photographs without any acknowledgment to the photographer. On the other hand, if the sitter was invited by the photographer to have a free sitting and afterwards purchased copies, the copyright in that case belongs to the photographer. For full information on the copyright question we would advise you to obtain the manual, "Photographic Copyright," issued by our publishers, price 1s. 2d. post free.

M. N. I.—Mercury vapour is a very bad light for projection, since the light is very greatly diffused instead of being at a single point as it is in the ideal illuminant for projection. Evidently, what you want is an ordinary high-power right-angle projection arc such as you can get from Mr. R. R. Beard, 10, Trafalgar Road, Old Kent Road, London, S.E., an experienced lanternist as well as a thoroughly reliable maker. In writing to him you want to find out from your local electrical people what amperage you can carry on the main at your disposal. Knowing that, you can select the arc accordingly.

B. W.—If the blind is in such a bad condition as to give the leakage represented by the negative—and that seems to be the only likely cause—we think that no dressing will put it in proper condition—at any rate, permanently. The usual dressing in such cases is a little rubber solution mixed with the finest lampblack. But we should think it is a case for a new blind, such as a firm like Messrs. H. T. Ball and Co., 52, Berwick Street, Oxford Street, W. 1, could fit. The Planar is rather a back number in lenses owing to its great liability to flare; the value of an 8-in. at the present time is probably not more than four or five pounds. We do not think there will be any advantage in dead-blacking the sheaths, the spots not having the appearance of being caused by them in any way.

Incandescent Gas, etc.—Would you kindly advise me how to light studio by incandescent gas, number of burners required and arrangement of same, also if a lens $f/5.65$ is suitable for the studio 12 feet in length?

You will need 12 or 15 burners to get reasonably short exposures. Suitable lamps for your purpose are the "Powerful" of Messrs. Kodak, Ltd., Kingsway, W.C.2, the "Howellite" of Messrs. Griffin, Ltd., Kemble Street, Kingsway, W.C.2, or that of Messrs. Tress and Co., Ltd., 4, Rathbone Place, Oxford Street, W.1. If you write to any of these firms they will send sketches. If you will state size of plate to be used and focal length of lens we can answer your second question. Twelve feet is very short for a studio if you want to make full-lengths.

C. E. W.—We should certainly recommend you to get a half-plate camera with as long an extension as possible, say 20 inches. With this you would require a good rapid rectilinear lens of about 8½-in. focal length and a 4¾ or 5-in. wide angle rectilinear. The R.R. will answer for the majority of subjects, and the front or back lens may be used alone for the bottles, jars, etc., for which you need a long-focus lens. The wide-angle is for interiors and outside views in confined situations. Have nothing to do with supplementary lenses for serious work. Enlargers just now are costly, but an adjustable daylight enlarger might be picked up cheaply, or you might enlarge by using your camera against a blocked-up window if you have a suitable room. You could of course take quarter-plates with the half-plate camera, and enlarge these in a small enlarging lantern with 5½-in. condenser, which would cost you about £7 or £8. But enlargements from small negatives are apt to look rather coarse for catalogue work, most of which is done direct.

Frilling.—Would you be so good as to let me know what you would consider the best remedy for the softening and consequent frilling of films during hot weather? Would it be harmful to films (or gaslight prints) to put alum in the acid fixing bath—as the films are often very soft before they even get to the washing stage? I use hypo. and metabisulphite for the fixing and metol-hydroquinone for developing—using the fixing bath for films after it has done service for print-fixing. Alum in the fixing bath would be the solution if it did not harm the film.

In hot weather most people use a fixing-hardening bath, formula for which is as follows:—20 ozs. saturated solution of alum, 4 to 7 ozs. saturated solution of sodium sulphite, and from 20 to 28 ozs. of hypo solution containing 1 part hypo dissolved in 5 parts of water. A bath of this kind should be sufficient to prevent softening of the films so long as they are handled as little as possible with warm fingers. Messrs. Johnson and Sons, 23, Cross Street, Finsbury, E.C., have just brought out a "tropical hardener" which is diluted to make a bath in which plates or films are soaked for three minutes before developing. A bath of this kind might perhaps suit you better for use when the temperature requires it, whilst leaving your customary arrangements (developer and fixing bath) undisturbed.

G. G.—With regard to the length of exposure, this is partly accounted for by the distance the lamps are from the sitter, and still more by the fact that you have opal diffusers, which stop nearly all the actinic quality of the light. The remedy will be to remove your lamps to the positions marked by the stars on your diagram, and to replace the opal by *thin* white calico. 3,000 c.p. does not allow much light to waste. If you are trying to work by reflected light only you will have to get the sitter about three feet from the wall. Your statements about distances for various sizes are unintelligible to us. What is the equivalent focal length of the lens, and what is the maximum aperture? The fog you complain of may be due to many causes besides faulty plates. Try developing an unexposed plate in absolute darkness for five minutes with a normal developer, and see if it fixes out clear. Also test your dark-room light; not a quarter of the red lights in use are safe for really rapid plates. Get a dozen fresh Imperial special rapid plates, and if you get foggy negatives with them you will know that the plates are not to blame. As regards the slowness of development, this seems to indicate that the solution is too weak, either from use or age. Make up fresh solution, and do not dilute so much if it still works slowly. Twenty minutes should be enough for tank development. Strengthen the solution so as to give full density in this time.

The British Journal of Photography.

The Oldest Photographic Journal in the World.

PUBLISHED EVERY FRIDAY. Established 1854. **PRICE TWOPENCE**

TERMS OF SUBSCRIPTION, POST FREE.

United Kingdom.—One Year, 10s. 10d.; Six Months, 5s. 5d. Three Months, 2s. 9d.

Canada ... ... Australia ... ... New Zealand ... ... South Africa ... ... United States of America South America ... ... India and Far East ... ... Continent of Europe ...	*One Year.* Thirteen shillings (13s.), or 3 dollars 17 cents, or 18 francs 50 cents, or 9 rupees 12 annas, or 6 yens 30 sens.
Federated Malay States, Borneo and Sarawak	5 dollars 57 cents.

Henry Greenwood & Co., Ltd., Proprietors and Publishers, 24, Wellington Street, London, W.C.2.

IMPORTANT NOTICE TO READERS.—Until further notice agents will supply the "B. J." to order only, as the high price prevailing for everything in connection with newspaper production prohibit the distribution of surplus copies for chance sales. It is therefore necessary in order to ensure the regular delivery of the "B. J." each week to place an order definitely with a dealer, newsagent or bookstall clerk, or to send a subscription to the publishers.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3086. Vol. LXVI. FRIDAY, JUNE 27, 1919. Price Twopence.

Contents.

	Page
Ex-Cathedra	361
Buying Second-hand Apparatus	362
A Focussing Screen for Photo-Micrography. By G. Ardaseer	363
Camera Movements. III. By D. Charles	364
How to Prepare Photographic Solutions. By J. I. Crabtree	365
Practicus in the Studio. By Practicus	368
Silvering Mirrors. By W. W. Wall	370
Photo-Mechanical Notes	370
Exhibitions	370
Patent News	371
Analecta	372
Meetings of Societies	372
Commercial and Legal Intelligence	374
News and Notes	374
Correspondence— New Sizes of Plates—Lenses—Assistants' Wages	375
Answers to Correspondents	376

SUMMARY.

Some points to be observed in the selection of wide-angle lenses, particularly with respect to the actual angle included, are noted in a paragraph on page 361.

The first portion of a practical article on the compounding of photographic solutions, dealing with weights, measures, percentages and other points will be found on page 365.

A very simple system of silvering mirrors which does not call for extreme purity of materials, and which is claimed to be very reliable in hot climates, is detailed on page 370.

The hand-camera is not so generally utilised by professionals as it might be. In his article this week "Practicus" gives hints on the capabilities of various types and their applicability to otherwise difficult subjects. (P. 368.)

The case for the employment of dry-plates in process work as being expeditious and economical is very clearly demonstrated in a paper on page 370.

Photographs on wood blocks are often required for catalogue work, and those who undertake them will find details of a simple process on page 372.

The final section of the article on camera movements deals mainly with the use of the swing back as an aid to focussing with large apertures. (P. 364.)

An application of an old photographic trick which may be turned to account by commercial photographers is described on page 362.

A paragraph dealing with the desirability of standardising the etching time for half-tone blocks so as to secure uniform tone and depth appears in "Photo-Mechanical Notes" on page 370.

A description of an easily-made focussing screen for fine detail such as is necessary in photo-micrography is given in a contributed article on page 363.

At the last meeting of the Professional Photographers' Association several points of interest were discussed, the question of specimens and an assistants' union being the principal ones. (P. 372.)

The new sizes of plates and a plea for the Petzval portrait lens are subjects of letters by our correspondents. (P. 375.)

Lens matters, studio lighting, and the clearing bath for platinum prints are dealt with among other subjects in "Answers to Correspondents." (P. 376.)

The specification of a patent flash-lamp of the type in which a match is used for igniting the powder is given with illustrations on page 371.

EX CATHEDRA.

Wide-Angle Lenses. There still appears to be a good deal of ignorance upon the subject of wide angle lenses, many photographers being at a loss when it comes to choosing a lens or lenses for exceptional subjects. Roughly speaking, a wide-angle lens is one which covers a plate the measurement of the longest side of which is greater than the focal length of the lens to be used. Thus a six-inch lens may be considered as embracing a wide angle upon a half-plate, this being 55°, allowing ⅛ in. rebate. Usually, however, much wider angles are embraced; many rapid anastigmats give an angle of 80°, while some of the types of wide-angle symmetrical will give 100°. Beyond this we have only the Hypergon, which gave about 130°, but was never much used, as the resulting perspective was grossly exaggerated. When the extreme angle of a lens is given in a catalogue it should be ascertained whether this is calculated for the base of the plate or the diagonal, as otherwise a lens embracing a less angle than is necessary may be selected. For example, if we wish to use a whole plate we may have to choose between two lenses of equal focal length, one being stated to have an angle of 90° while the other claims for 78° only. Yet if both be used upon a rectangular plate, exactly the same amount of view is included, the former angle being only obtainable in a circular picture, which is seldom required. We have sometimes found it useful to use a plate a size larger than the lens is supposed to cover and to cut from the circular image so much as can be utilised. Thus, with a four-inch rapid rectilinear a panoramic view 8 x 3 ins. can be obtained upon a whole plate, and by blocking out the sky so as to cover the dark corners a greater width could be used.

* * *

Side Lines. We fear that in the past photographers have allowed many opportunities of adding to their business to pass by without knowing it. Particularly is this the case with regard to photo-mechanical work, such as half-tone blocks and printing and collotype. In many cases they have made negatives to order for a comparatively small amount; from these, orders amounting to perhaps hundreds of pounds have been executed, often by people who are merely agents, who make a handsome profit by handing them over to firms actually producing them. In pre-war days quite a large business was done in this way with German collotype printers, a large proportion of the view postcard and catalogue business being handled in this way. As soon as the commercial world settles down to serious work there is bound to be a large demand for illustrations by manufacturers and others, and we hope that our readers who have a connection with such people will endeavour to keep the whole

business in their own hands instead of merely assisting at the start. They will need to see that they do that, for many printing firms will send operators to make negatives of, or at, a factory, when the local photographer, if sufficiently awake, might have secured the entire job. We do not believe that many photographers have troubled to acquaint themselves as to the various ways in which photo-mechanical prints can be made, much less to provide themselves with full sets of specimens in different styles. Almost any kind of print can be imitated in collotype, from a glazed P.O.P. to a platinotype, and for less costly work fine half-tone work comes in a good second. There are several English firms who will undertake this work for photographers, who then have only to secure the order and pocket their profit, which may be anything from 10 to 20 per cent. This may seem small compared with portrait profits, but it must be remembered that such orders are usually for large amounts, and that even at the smaller figure there is £20 to the good on a £200 order. A branch in which many will feel more at home is in handling large orders for bromide prints. The wholesale firms who use machinery for producing these can quote prices which will leave a substantial profit, and the work can be relied upon for uniformity.

* * *

Panchromatics and Speed. There seems upon the part of many professional photographers a decided reluctance to the use of panchromatic plates. Perhaps one reason for this is the idea that the exposures are unduly long for portrait work. This is really not the case, and if in exceptional circumstances the exposure would be unduly long, with a K2 filter—which is perhaps the most generally useful—the screen may be omitted altogether and a result produced that will be far in advance of the ordinary non-ortho plate. In fact, a panchromatic plate, if used without a screen, is equal to one of the special rapid variety, and will produce a result equal to the orthochromatic plate with a four or five times screen. In practical work this is a great advantage when only partial colour correction is required and the speed of the plate has not to be sacrificed. Panchromatic plates should always be used, either with or without a screen, when working out of doors late in the day, when the light is inclined to be yellow or red, and will show a marked increase in sensitiveness over the non-ortho grades. In this respect the panchromatic plate should prove of service to press operators.

* * *

Duplex Exposures. The old method of trick photography by means of which the same person may be shown in two or more positions upon the same plate is well known to most photographers, but a recent inquiry as to the best way of setting about it suggested an application which in some circumstances would be of practical value and not a mere curiosity. For the benefit of those who may not understand to what we refer, we may explain that it is quite easy to make photographs in which a man may be playing a game of chess with himself, or a lady standing and singing while she also appears to be seated at a piano, playing the accompaniment. This is done by the simple expedient of providing the lens with a very deep box hood with two flap shutters overlapping very slightly in the centre. One of these is closed and the sitter taken in the first position; it is then closed while the sitter moves into the second position, when the other shutter is opened and the exposure made. The two halves of the picture then appear so perfectly vignetted into each other that no junction is visible. The application suggested is that this trick may be employed when it is desired to take two views of any object without a line of demarcation appearing between them. For example, the front and back of a vase or statue or two views of a piece of machinery may thus be taken, or a figure photographed in front and behind for a fashion plate. A little practice may be necessary to get the exact amount of overlap, as if this be too great there will be a rather lighter band down the centre and if too little a dark line, but this can easily be adjusted. The necessary fitting can be made of cardboard and must be well blackened inside.

BUYING SECONDHAND APPARATUS.

The business in the purchase and sale of secondhand apparatus has probably never been upon so large a scale within the memory of photographers as it has been of late and is likely to be for some time to come until the normal output of manufacturers is restored. Hence a few notes on the purchase of apparatus may not be out of place. A prospective buyer has two courses open to him in supplying his wants. According to the first, he may watch the advertisements of goods which are offered, or himself insert an advertisement of what he requires, or, according to the second, may state his requirements to the dealers in secondhand requisites. There is something to be said for both methods. In dealing with strangers it should be an invariable rule not to send money, but to insist that the transaction should pass through the deposit system of the paper in which the advertisement appears. Certainly something may be gathered from the style of an advertiser's letter-heading or writing, but it does not need much knowledge of human nature to know that a favourable impression in either of these respects may be created by a rogue. There is, moreover, the trouble of getting goods on approval and of coming to an agreement with the advertiser as to the payment of carriage in the event of their not being purchased. On the other hand, the price asked by a private advertiser is very often less than that required by a dealer, and the would-be seller, if he can find a reliable purchaser, would rather dispose of his goods in this way than to a dealer, on account of the better price which he gets. There is nothing contradictory in these two statements since a dealer's price when purchasing is usually one which provides a very ample margin against the contingency of the money represented by the goods lying idle for a long period until a re-sale is effected.

The advantages that the dealer offers are many. Having a large stock, he can nearly always supply a camera or lens of almost any required pattern from stock. In most cases a guarantee is given that it is in good condition in the case of a large dealer. The apparatus may be had on approval and tested to the user's complete satisfaction without the fear that might reasonably be entertained about an unknown stranger that sharp practice or reluctance to release any deposit may cause a lot of trouble before the affair is finally settled.

Before taking the various classes of apparatus in detail a word may be said about the price. At the present time, owing to the almost total absence of new goods from the market, second-hand apparatus is fetching a high price. In some cases recently cameras and lenses have been fetching more on the second-hand market than they did a few years ago when brand new. We think many photographers lose sight of a very important point when buying apparatus, and that is how the particular goods appear in the light of an investment; how they will re-sell in the event of their owner having no further use for them. In this the old axiom is true: that the best is always the cheapest. At the present time old or out-of-date apparatus may be bought for a pound or two. What will be

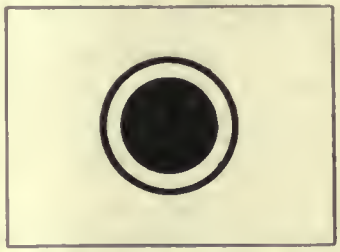
its value a year or two hence?—possibly only a few shillings. Then those whose habit it is to compare prices will often find that one particular pattern of camera and lens, or lens alone, for that matter, may be quoted at a certain price. Another of the identical type may be quoted by the same or another firm for perhaps twenty-five per cent. less. It must not be inferred that the one is a bargain and the other excessively dear, because the reverse may actually be the true order of things. In fact, the price asked by a reliable firm may be taken as a criterion of the quality of the goods. If two models are priced as described above by competing firms it may be assumed that there is something about the one instrument that makes it worth more than the other. The camera or lens may be of more modern pattern; or, if this is not stated, it is almost certain to be in the better condition. We have seen apparatus on the market that, knowing the trouble that will arise from its use or the cost of its repair, even assuming that such is possible, we should consider dear at any price, and in this way the reputation of an established dealer becomes of real value to the prospective purchaser.

Coming now to the defects to be looked for in apparatus of various descriptions, field or studio cameras require to be examined for warped, split, or scratched woodwork, worn, bent, or loose-fitting struts. The bellows should be carefully looked at; what is described as leather may actually be imitation leather or cloth. The camera should be racked out to its fullest extent in a dark room and an electric bulb placed inside it in order to test the light-proofness of the bellows. The latter, if old or worn, will be found to be loose and to sag, and are then certain to give a good deal of trouble in the way of cut-off. Rigidity of the back and of the front of the camera when erected are specially important points, and the intending purchaser will hardly neglect to examine the focussing mechanism for smoothness of movement. A camera which has had a good deal of wear, or has been roughly used, will allow of the focussing heads being turned through an appreciable angle without any corresponding movement of the front or back, as the case may be. This "backlash" makes accurate focussing by no means a matter of certainty. In the case of folding focal-plane cameras a feature of prime importance is rigidity of the strut system by which the front is held extended. If this is defective a satisfactory repair may cost quite as much as will discount any benefit from the purchase. In testing the shutter of such cameras the intending purchaser should not omit to try it at the lowest speed. A shutter which may work satisfactorily at the maximum spring tension may prove erratic at the lower speed as a result of weakening of the springs. Here again it requires to be borne in mind that the repair of a focal-plane shutter is usually somewhat expensive.

In case of book-form slides attention should be given to detect warping. In one case we knew a double mahogany book-form slide had warped to such an extent that it could not be inserted in its grooves in the back of the camera. The slide should be held quite close and firmly by its catches, preventing the admission of light. Any shrinkage of the woodwork will cause the springs or catches to hold loosely. If the two halves of the slide may be moved with the catches in position shrinkage of the wood has taken place, and it should be regarded with suspicion. The draw-out shutters should work smoothly in the grooves. In the case of metal slides the draw-out shutters should be examined with a view to detect dents or abrasions, which, owing to the very slight clearance may scrape the surface of the plate when being drawn out. Vulcanite draw-out shutters should be examined for pinholes, which have been known to appear after a course of ill-usage.

A FOCUSSING SCREEN FOR PHOTO-MICROGRAPHY

The ordinary fine ground-glass screen, when used for daylight landscape and portrait photography, is satisfactory enough, but the photo-micrographer needs to get an exceedingly sharp image, far surpassing in that respect what is necessary for the photographer. The method of first arranging the subject on ground glass and substituting a piece of polished plate glass, on which to obtain, by means of a properly focussed magnifying glass, a critically sharp aerial image, though perfectly satisfactory, is a somewhat troublesome method. Another well-known method is to cement with Canada balsam a small microscopic cover glass on the ground surface, in any position that suits the fancy or requirements of the photo-micrographer. This method is also fairly satisfactory. But the following method of preparing a focussing screen has in my hands produced a screen combining the advantages of both the above. Moreover, should an accident happen to the screen, or the plain surface become scratched from the continued use of the focussing glass, a new screen can be made very quickly. The process is a slight modification of the method which I gave in a photographic annual of 1892. I there wrote:—"Expose a dry plate of the required size to gaslight for a second or two, then develop until a slight grey deposit is obtained, wash and fix; wash, and when dry the surface will be found admirable for a screen." The modification consists in retaining certain portions of the film to fix out clear. I prepare the mask by pasting on a clean, say, half-plate glass a central opaque disc of paper of 2-inch diameter, and concentric with this a ¼-inch ring of similar opaque paper of maximum diameter, 2¾ ins. When dry, this is placed in a printing frame, like a negative, and the half-plate lowered, film downwards, on to the papered side. Exposure is made, and the plate developed until there is a well-marked deposit, and this is easily gauged owing to the clear ring and disc. When fixed, washed, and dried, the screen is complete, and is a joy to use. The Rev. F. C. Lambert considers it necessary to iodise the film by means of an iodine and iodide of potassium solution. This, I think, is a mistake, as the grain of the plate



is rendered coarser by the conversion into iodide. Moreover, Mr. Lambert scratches away the film to obtain clear glass. This is a troublesome business, and also wrong theoretically, as it changes the plane of the image, though in practice this is negligible. The figure will no doubt render the matter quite clear. The diagram shows the clean glass, with central disc and ring of opaque paper, and the resulting screen will, of course, be the positive of this negative.

With this arrangement a sufficient amount of the object can

be seen in the annular space to get a rough focus, and the portion selected for photography can be arranged to fall within the outer ring, with the certainty of being within the compass of a 3-inch lantern slide mask. Of course, the final critical sharpness is obtained with the focussing glass. It is also a convenience to make a dot or small cross with ink on the film side in the centre of the clear disc. This not only indicates the centre of the photograph, but is a test for the proper adjustment of the focussing glass.

G. Ardaseer.

CAMERA MOVEMENTS.

III.

In Section II. the swing-back was shown in use for a specific purpose in which it unavoidably upset the performance of the lens, and thereby called for much stopping-down, and consequently increased exposures. In this section it will be shown how in subjects where vertical lines do not exist the swing-back can be employed to help the lens, and allow it to be used at a large aperture with short exposures as a result.

In portraits it is usual to have the lens above the centre of the subject, and pointing slightly downwards. It is only when using a reflex, for instance, or a snapshot camera, that it would be held level with the waist for a full-length figure. For portraits the camera is generally somewhere about the same height as one's own face is. This is not intended to teach the art of portraiture, which is a separate subject altogether, but it will be seen that it is necessary to point the camera downwards, because otherwise too much space would be included above the head, and the falling-front is not often used, because portrait lenses seldom give good definition in the margins, and cameras rarely allow enough drop, even if the lens permitted of this movement being employed.

Now it can be seen quite plainly that with a camera placed as described the head of the sitter will be nearer the lens than the lower part of the subject, whether it be the feet in a full-length, or the breast in a "head-and-shoulders" portrait. As previously stated, the image of the head will be rendered sharp on the ground-glass when the latter is further from the lens than it is when the other part is sharply focussed. If therefore the top of the focussing-screen is swung slightly towards the lens, it will be found possible to get (by a little trial and error in adjusting the swing-back and the focussing pinion) both parts of the image sharp without stopping down at all. Similarly, if one shoulder is turned away from the camera, a side-swing can be used to get both shoulders sharp at the same time. For that reason most studio cameras as provided with a side-swing, but stand-cameras rarely are.

In the latter, the movement is seldom called for, except for photographing a receding row of houses or a railway train, etc. Sometimes a little slackness in the camera parts allows of a certain amount of side-swing, or, if not, it can generally be temporarily introduced if required in an emergency by loosening a few screws. The rule is, that the ground-glass is nearer the lens for the distant part of the subject, so that once the principle is understood it will be sufficient to swing the back parallel (or thereabouts) with the subject itself, and then little adjustment will be required beyond this to get all the details sharp at a large aperture.

It requires to be impressed on the student that it is only points that lie in one plane that can be obtained sharp in this way. For instance, the swing-back is frequently employed to get the different rows of heads in a large group sharp when the light is not bright enough to allow of much stopping-down. In this case the plane focussed on is the one in which all the heads lie, and the feet of the front row will be a good deal out of focus, so that in a group consisting of several rows it is not advisable to have any figures seated on the ground among the feet of the front row, as children are often placed, if it is proposed to swing the back and use a large aperture.

In pure landscape photography the back swung with the top away from the lens will render a large expanse sharp at a very large aperture indeed. Thus a river, crowded with boats, or other subject with much detail from quite near to extreme distance can be photographed "instantaneously."

So far I have not dealt with the swing-front, which has certain advantages over the swing-back, but also some rather strong disadvantages. In architectural work, it seems immaterial whether we first point the camera upwards and then swing the back vertical or first level the whole camera, and then point the lens itself upwards. The advantage of the latter method, which entails the use of the swing-front, is that if the image is not quite central on the focussing-screen the camera may be revolved without any readjustment of the parts being required Another strong advantage of the swing-front is the comfortable manner in which the image can be observed while the lens is being adjusted.

The same remarks apply to the use of this movement in other branches, but the great drawback attaching to it is that swinging the lens throws the centre of the image a long way from the middle of the ground-glass and the rising or falling front has to be brought into play to correct this. In extreme cases the latter movement will be all taken up in correcting this fault, and no benefit will be obtained from it on its own account. So that unless a camera is built with an extraordinary range of movement it will be found best in the vast majority of cases to stick to the rising-front and the swing-back as the most adaptable movements. There are cases, however, where the swing-front will enable one to do what would otherwise be impossible. Take, for example, a large group as previously mentioned. In a dull light the swing-back brings the various rows of heads into sharp focus without stopping down. But supposing the group is posed in front of a building. The suggested use of the swing-back would distort the vertical lines violently, so that if the back is fixed vertically to keep the lines of the building true, and we swing the lens slightly upwards, we can still get the same apparent depth of focus in the faces which could not otherwise be obtained without considerable stopping-down.

This brings one to the matter of the lens, stops, or diaphragm. The smaller this is, in proportion to the camera extension, the longer the exposure required. This has been scientifically worked out into a series of proportionate sizes which are marked on the mounts of all modern lenses in such a way that the exposure for each can be accurately determined. These opertures are such that each requires exactly double the exposure of the next larger one, and for a fuller understanding I would refer the reader to the instructions for use of any good exposure meter, without which no outfit is really complete.

D. Charles.

Green's Electric Retouching Pencil.—We are asked by the Lightning Retoucher Company, Stebbins Block, Michigan, U.S.A., to point out that there are no restrictions on the shipping of this speciality from America, as these goods are not regarded by the Department of Import Restrictions in this country as coming within the scope of the prohibition of imports at present in force.

HOW TO PREPARE PHOTOGRAPHIC SOLUTIONS.

[The following paper, contributed by Mr. J. I. Crabtree, of the Eastman Research Laboratory, to the "Motion Picture News," contains so much in the way of plainly-expressed instruction on the compounding of the commonly used photographic solutions that we venture to say there is not a single photographer who will not get some practical hints from it. In reprinting it as it stands it is necessary that we should make clear the difference which exists between the measures of volume used in this country and in the United States. Mr. Crabtree, in addressing himself to American workers, refers only to the measures used in the United States; but it requires to be pointed out that the American pint and the American gallon are different from the measures of volume employed under the same name in Great Britain and in many parts of the British Empire. The U.S. pint is one of only 16 ounces, equal approximately to 500 c.c.s.; and the U.S. gallon is, therefore, one of only 128 ounces, equal approximately to 4,000 c.c.s. On the other hand, the Imperial pint, as the British standard is called, contains 20 ounces, equal approximately to 600 c.c.s.; whilst the Imperial gallon contains 160 ounces, equal approximately to 5,000 c.c.s. The ounce is the same in both systems, and there is no difference in the avoirdupois weights commonly used in this country and America.—Eds. "B.J."]

Although the majority of amateur photographers prefer to purchase photographic chemicals in a condition ready for use, in the case of advanced amateurs, professional photographers and motion-picture producers who use chemicals on a large scale, it is customary for them to prepare the various photographic solutions from the component chemicals.

In order to be able to prepare correctly any and every solution used in photography a knowledge of the properties of the chemicals used and of the chemical reactions involved during the mixing is essential, though by adhering strictly to printed directions it is usually possible for an unskilled worker to prepare the developing and fixing solutions as generally used. However, instructions for the use of various materials differ, for example, in the case of some developing formulæ it is recommended to dissolve the Elon first, while according to others the sulphite should be dissolved first. Both methods may be right, but if a systematised method of mixing is followed, and especially if the photographer has a knowledge of the reactions involved, then he can proceed to mix any developing solution with confidence, and what is more, he will be able to locate the trouble if for any reason the solution does not work correctly after mixing.

In this article it is the purpose of the author to describe in as non-technical language as possible the systematised method of preparing solutions now practised in the research laboratory of the Eastman Kodak Company.

Definitions.

A *solution* of any kind is obtained by dissolving a solid or a liquid in another liquid (or solid). The substance being dissolved is called the *solute*, and the liquid in which it is dissolved is called the *solvent*. The extent to which the solute is soluble in the solvent is called its solubility, and when the solvent will hold no more of the solute it is said to be *saturated*.

The degree of solubility of any chemical depends on the nature of the solvent and on the temperature, which should always be stated.

If a saturated solution is cooled down to a lower temperature, crystals usually form which settle out until the saturation point is reached at that particular temperature, though in the case of a substance like hypo, if all dust is excluded, crystals do not separate out on cooling, and a so-called *super-saturated* solution is obtained. However, if a small crystal of hypo is added to the solution, crystals immediately form and continue to grow until the saturation point is reached. The best method of preparing a saturated solution therefore is to dissolve the chemical in hot water, cool to room temperature with shaking, allow to stand, and filter.

Meaning of "Water To."

When a chemical is dissolved in water the volume of the solution is usually greater than that of the water used, because the particles or molecules of the chemical occupy a certain space when in solution. In case two liquids are mixed, the final volume of the liquid is not necessarily equal to the sum of the volumes of the liquids mixed, it may be greater or it may be less. Thus fifty volumes of alcohol when added to fifty volumes of water at 70° F., produce ninety-seven volumes of the mixture and not one hundred. Moreover, equal weights of different chemicals do not occupy the same volume.

In photography we are concerned only with the weight or volume of each chemical in a fixed volume of the solution, so that when mixing, the chemical should be dissolved in an amount of water appreciably less than that called for in the formula, and then water added *up to* the amount stated.

The Metric System of Weights and Measures.

In photographic practice, *solids* are *weighed* and *liquids* are *measured* either by the metric or the avoirdupois system.

Although a large majority of photographers use the avoirdupois system of weights and measures, this system is inconvenient and complicated as compared with the metric system.

The metric unit of length is the *metre* (which means measure). The metre is divided into one hundred parts called *centimetres* or *cms.*

The unit of volume is the cubic *centimetre*, written *cc.*, or *ccs.* in the plural, 1,000 ccs. being equal to one *litre* or 1 L. The cubic centimetre is sometimes termed a *millilitre* or *ml.* (meaning one-thousandth part of a litre) though the term cc. is satisfactory for photographic purposes.

The unit of weight is the *gramme* which is the weight of 1 cc. of water at 4° C., at which temperature a given volume of water weighs the most. The gram is written Gm. for short, the capital letter G being used so as to differentiate between Gms. (grammes) and grs. (grains).

For compounding photographic formulæ only Gms., ccs., and litres are used, and fractions are always expressed as a decimal just as in the case of the U.S. currency which is a metric currency. The beginner should therefore think of grammes and parts of a gramme as if they were dollars and cents. Thus, 535 Gms. corresponds to $535 or $535/100.

The Avoirdupois System.

In photography the following table is used:

Weight.		*Volume.*	
437 grains	= 1 ounce ...	60 minims	= 1 fluid drachm
16 drachms	= 1 ounce ...	8 fluid drachms	= 1 fluid ounce
16 ounces	= 1 pound...	480 minims	= 1 fluid ounce
		16 ounces	= 1 pint[1]
		128 ounces	= 1 gallon

The Conversion of Formulæ.

Every photographer should be able to convert a formula given in avoirdupois terms into metric equivalents without reference to a table. It is simply necessary to remember that—

15 grains	=	1 Gm.
1 ounce	=	30 Gms.
1 fluid ounce	=	30 ccs.
1 gallon	=	4 litres[2]

(1) The Author is here speaking of the American pint of 16 ounces equal approximately to 500 ccs.

(2) The author here refers to the American gallon of 128 ounces. The English (Imperial) gallon contains 160 ounces equal approximately to 5,000 ccs.

from which it is readily deduced that—

2 pounds (roughly)	=		1 kilogram
1 ounce ,,	=		450 grs.
1 pint ,,	=		500 ccs.
1 cc. ,,	=		50 minims

The foregoing conversion figures are not strictly correct, for example one gramme=15,432 grs., 1oz.=28.35 Gms. and 1 fluid oz. = 29.43 ccs. In taking 1 Gm. as an equal to 15 grs. we are making an error of four parts in 154, or nearly 3 per cent., but in photography on error of 5 per cent. in most cases is permissible. Thus if a formula called for 453½ grs., if this were cut to an even 450, the difference would not be detectable by photographic means, though if a quantity of 6½ grains were cut to 5 grs. then the error (20 per cent.) would be serious.

Uniformity in Formulæ.

Formulæ should always be given in both metric and avoirdupois equivalents, but in some cases the proportions are given for, say, 40 oz., in one case and 1 litre in the other. Now 40 oz. = 1,200 ccs., so that the several quantities are not equivalent. This leads to error in case the chemicals are weighed out with avoirdupois weights, and the solution made up to strength in a litre graduate, though if these quantities are given for 32 oz. of solution which are equivalent to 960 ccs., or roughly 1 litre, no serious trouble will arise if the above mistake is made.

The *order* in which the ingredients are given in the formulæ is of importance. In some cases water is placed first, in other cases last, but since all developers are mixed with water, its position should be last in the formula. The ingredients should be given in the order in which they are dissolved, which is as follows: (1) preservative; (2) developing agent; (3) accelerator; (4) restrainer; (5) water to.

Percentage Solutions.

In photography two kinds of solutions are used as follows:

(a) A solid in a liquid.

(b) A liquid in a liquid.

(a) The misunderstandings which have arisen from time to time regarding the correct method of preparing solutions of a definite percentage strength is due to the fact that there are three ways of doing it. For example, we can make a 5 per cent. solution of potassium bromide as follows:

(1) Dissolve 5 Gms. in 100 ccs. of water.

(2) Dissolve 5 Gms. in 95 Gms. of water making 100 Gms. of solution.

(3) Dissolve 5 Gms. in a little water, and make *up to* 100 ccs.

In case (1) we have about 103 ccs. of solution, and in case (2) about 98 ccs. A chemist would use method (2), but method (3) is used when preparing photographic solutions. Method (1) is not used for the reason given above, namely, that equal weights of different chemicals do not occupy the same volume.

The percentage strength of a solution therefore merely indicates how much of the chemical is dissolved in 100 ccs. of the solution.

To prepare a 7 per cent. solution of potassium bromide, therefore, take 7 Gms. of the salt, dissolve it in a litle water, and add water *up to* 100 ccs. If we now measure out 100 ccs. of the solution we have measured 7 Gms. of the solid.

In the avoirdupois system a 10 per cent. solution of solid is made by taking 1 oz., and making up to 10 oz. with water. Converting these figures into Gms. and ccs. we have 30 Gms. in 300 ccs., or a 10 per cent. solution.

Strictly speaking, this is not correct, since 1 oz. = 28.35 Gms., and 1 fluid oz. = 29.57 cc., so that 1 oz. in 10 fluid ozs. is equivalent to 28.35 Gms. in 295.7 cc. or 9.6 Gms. in 100. The error involved, however, is less than 5 per cent., and for ordinary purposes is therefore negligible.

If a photographic solution is made by any of the above methods, 1, 2, or 3, the error involved is less than 5 per cent., and therefore negligible for ordinary photographic purposes, though since the correct method is the easiest, it should be followed.

Although somewhat of an anomaly, it is possible to prepare a 100 per cent. solution of a substance like hypo by dissolving 100 Gms. (which do not occupy a space of 100 ccs.) and dissolving in sufficient water to make 100 ccs. of solution.

(b) A 10 per cent. solution of a liquid in water is made by taking 10 cc. of the liquid and adding water up to 100 cc.

The Meaning of "Parts."

It is often recommended to dissolve, say, 10 parts of a solid in 100 parts of water. Such a statement is meaningless because a solid chemical is weighed while a liquid is measured, though if the metric system is used, since 1 cc. of water weighs 1 Gm., then grams and ccs. may be considered synonymous with *parts*.

In the case of liquids, *parts* should be taken as meaning *units* of volume, and in the case of solids as *units* of weight A "part" may therefore mean anything from a gramme to a ton, or a cc. to a gallon so long as the other quantities are reckoned in the same units of weight or volume.

Thus:

For use:	A three parts	A 300 ccs.	A 15 oz.
	may mean	or	
	B one part	B 100 ccs.	B 5 oz.

If the avoirdupois system is used and the formula contains both solids and liquids, if ounces (liquid) and ounces (solid) are substituted for "parts," the error involved falls within permissible limits.

Problem.—Mix one gallon (U.S. of 128 oz.) of solution, according to the following formula:—

Sodium sulphite	10 parts
Pyro	1 part
Water to	100 parts

Now, one gallon equals 4,000 ccs. Therefore, dissolve 400 Gms. of sulphite in water, add 40 Gms. of pyro, and make up to 1 gallon.

"Drops."

If a formula calls for, say, 5 drops of a solution, this is a very uncertain quantity because drops of liquid vary considerably in size. The average drop from the usual dropping bottle or burette measures about 1 minim or a little less than one-tenth part of a cc., so that 5 drops may be considered as 1/3 cc. or 5 minims.

The Hydrometer Test.

Many photographers are accustomed to making up their stock solutions of hypo, carbonate, sulphite, etc., by means of the hydrometer. This method has the advantage that in case the hypo (say) has become moist and contains an unknown amount of water, a definite reading on the hydrometer will give a solution of the same strength as if perfectly dry chemicals had been used. When a stock solution is made from moist chemicals by weighing, the error caused by the presence of water may be as high as 25 per cent. or 50 per cent.

The hydrometer method has the disadvantage that the adjustment of a solution to the required strength takes considerable time, the hydrometer reading does not convey an idea as to the percentage strength of the solution, while the hydrometer reading varies with the temperature. For instance, if a stock solution is made with hot water and this registers, say, 45 on the hydrometer, on cooling, the liquid may register 48 or 50. It is therefore absolutely necessary either to make all readings when the solutions have cooled to room temperature, or to prepare a table giving the variation of density of each solution with temperature.

Usefulness of Per Cent. Solutions.

The great advantage of stating the strength of any solution in parts per hundred is that a definite mental picture is at once created of its relative strength, while by means of a number of stock solutions it is possible to compound certain formulæ by

simply measuring out a definite volume of each solution thus dispensing with a balance. Thus, supposing we have a 10 per cent. solution of potassium ferricyanide and of potassium bromide already at hand, and it is desired to make up the following solution:—

Potassium ferricyanide ..... 6 Gms.
Potassium bromide ..... 2.3 Gms.
Water to ..... 1,000 ccs.

then it is only necessary to measure out 60 ccs. of the ferricyanide solution, 23 ccs. of the bromide solution and add water up to 1,000 ccs. and the solution is made.

In the case of very concentrated solutions it is not always possible to use this method, though in view of the time saved, and the accuracy of the method, it should be applied whenever possible.

Suppose a formula calls for 0.1 Gms., it is impossible to weigh this amount accurately on the usual photographic scale, but by measuring out 1 cc. of a 10 per cent. solution, and adding this to the mixture, the problem is solved.

Photographic Arithmetic.

It is often required to mix up a quantity of solution much greater than that given by the formula, in which case the photographer must perform a very simple exercise in arithmetic in order to secure the desired result. The two following examples indicate the method of solution of such simple problems.

A. Mix 6 oz. of solution according to the following formula:

Potassium ferricyanide .....4 Gms.
Hypo .....10 Gms.
Water to .....100 ccs.

now 6 oz. = 6 x 30 = 180 ccs. Therefore, we need 180/100 x 4 = 7.2 Gms. of ferricyanide and 180/100 x 10 = 18 Gms. of hypo. Dissolve these in a little water and make up to 180 ccs.

B. How would you mix 1 pint of a 7 per cent. solution of sodium sulphite?

To make 100 ccs. of a 7 per cent. solution we need 7 Gms. Therefore, to make 1 pint (500 ccs.) we need 5 x 7 = 35 Gms. To prepare the solution therefore, dissolve 35 Gms. of sulphite in water and make up to 1 pint (16 oz.).

Dilution of Liquids.

It is often required to reduce the percentage strength of a solution. For example: How would you mix two gallons (U.S.) of 28 per cent. acetic acid, from a supply of glacial acetic acid?

To make 100 ccs. of 28 per cent. acid we need 28 ccs. of glacial acid.

To make 1 cc. of 28 per cent. acid we need 28/100 ccs. of glacial acid.

To make 8,000 ccs. of 28 per cent. acid we need 28 x 80 = 2,240 ccs. of glacial acid.

Therefore take 2,240 ccs. of glacial acid and add water to make 2 gallons (i.e. 256 oz.).

To dilute a solution three times we do not add three times the amount of water, but twice the amount, and so on. For example: One volume of solution plus 2 volumes of water = 3 volumes of solution, which is three times as weak, or three times as dilute as the original.

Stock Solutions.

A stock solution is a concentrated solution to which water is added before use. In the case of simple solutions containing only one salt such as potassium bromide, sodium carbonate, etc., a 10 per cent. solution is most convenient because by multiplying the volume of the solution in ccs. by 10 we get the number of grams present in the solution. Thus 75 ccs of 10 per cent. potassium bromide contain 7.5 Gms.

The limiting strength of solution which it is possible to make in any particular case depends on the solubility of the chemical, and as the solubility diminishes with temperature a solution should not be made stronger than a saturated solution at 40° F., otherwise in cold weather the substance would crystallise out. (The reader is referred to tables of solubilities given in most handbooks.)

A stock solution of sodium sulphite should be made as strong as possible (15 per cent. of the desiccated salt) because at such a strength the solution oxidises very slowly, and will therefore keep, whereas in weaker solution it combines with the oxygen in the air very readily, and is then useless as a preservative.

Apparatus.

Scales.—For quantities up to 100 Gms. a double pan balance should be used, and a larger one for quantities up to 1,000 Gms. For still larger quantities a platform scale weighing in pounds may be used, because large metric scales are not readily procurable. For preparing small amounts of sample developers a small chemical balance weighing in hundredth parts of a gramme is necessary

Mixing Vessels.—For small quantities of solution conical glass flasks are the most suitable. For larger quantities use enamelled buckets. Earthenware crocks are usually unsatisfactory, because when the glaze cracks, the solutions penetrate within the pores, and thus contaminate any other solutions subsequently mixed in it.

A wooden stick or paddle is the best form of stirrer, but a separate one should be used for each solution so as to eliminate the possibility of contamination.

The paddle may also be used to measure out a definite volume of solution in a tank or crock by cutting notches in the paddle to correspond with definite volumes when held vertically. Such markings are only applicable, however, to the particular tank or crock for which the paddle was graduated, so that a separate paddle should be used for each tank or crock unless they are of the same shape and capacity.

Chemicals should be weighed out and the solutions prepared in a separate room, and care should be taken when handling such substances as hydroquinone, resublimed pyro, potassium ferricyanide, etc., not to shake the finer particles into the air, otherwise they will enter the ventilating system and settle out on benches, negatives, and prints, and cause no end of trouble in the way of spots and stains.

Weighing and Measuring.

Weigh out chemicals on pieces of paper, and after transferring to the mixing vessel do not shake the paper, but drop it into the sink and allow water to flow over it, thus dissolving the dust. Larger quantities are most conveniently weighed out in buckets.

For small quantities a glass graduate marked off in ccs. or ounces should be used, for larger quantities use a bucket previously graduated, or mark off the inside of the tank or crock used for mixing. When measuring a liquid in a glass graduate place the eye on a level with the graduation mark, and pour in the liquid until its lower surface coincides with this level. Owing to capillary attraction the liquid in contact with the walls of the graduate is drawn up the sides so that on viewing sideways it appears as if the liquid has two surfaces. All readings should be made from the lower surface and at room temperature because a warm liquid contracts on cooling.

Dissolving

The rapidity with which a substance dissolves in any solvent depends on its solubility and degree of fineness, the temperature of the solvent, and the rate of stirring. Since a chemical is usually more soluble in hot water than in cold the quickest way of mixing a solution is to powder it up and dissolve in hot water with stirring. In the case of a few substances like common salt which are only slightly more soluble in hot than in cold water, the use of hot water is of no advantage.

Since most solutions are intended for use at ordinary temperatures, if hot water is used for dissolving, the solution must

be cooled off again if it is required for immediate use, though usually the time taken to do this is less than the extra time which would be taken up in dissolving the chemical in cold water. When mixing, therefore, as a general rule dissolve the chemical in as small an amount of hot water as possible, cool off, and dilute with cold water.

After diluting with water, thoroughly shake the solution if in a bottle, or stir if in a tank, otherwise the water added will simply float on top of the heavier solution.

When mixing a solution in a tank, never add the dry chemicals to the tank, but always make sure that the chemicals are dissolved by mixing in separate buckets and filtering into the tank.

If the water supply is not sufficiently cold, so that on diluting the hot solution the final liquid is not at the required temperature, the hot solution should be cooled by means of ice placed in a cloth bag to filter out the dirt.

In the case of anhydrous (dry) salts such as desiccated sodium carbonate, sodium sulphite, etc., always add the chemical to the water and not vice versa, otherwise a hard cake will form which will dissolve only with difficulty. J. I. CRABTREE.

(To be continued.)

PRACTICUS IN THE STUDIO.

[Previous articles of this series, in which the aim of the writer is to communicate items of a long experience in studio portraiture, have appeared weekly since the beginning of the present year. It is not thought possible to continue the series to the length of that by the same writer which ran through the "British Journal" some years ago, but if any reader among the younger generation of photographers, and particularly those engaged as assistants, has a particular subject which might be dealt with, his or her suggestion will be welcomed. The subjects of the previous articles of the series have been as follows:—

A Talk About Lighting (Jan. 3).
The Camera and the Lens (Jan. 10).
Managing the Sitter (Jan. 17).
Backgrounds (Jan. 24).
Studio Exposures (Jan. 31).
Artificial Lighting (Feb. 7).
Printing Processes for Portraiture (Feb. 14).
Studio Accessories and Furniture (Feb. 21).
The Surroundings of the Studio (Feb. 28).
Studio Heating and Ventilation (March 7).
The Postcard Studio (March 14).
The Printing-Room (March 21).
About the Reception Room (March 28).
Home Portraiture (April 4).
Portable Studios (April 11).
Copying (April 18).
Handling the Studio Camera (April 25).
More About Lenses (May 2).
Enlargements (May 9).
Advertising the Studio (May 16).
Mounts and Mounting (May 23).
Business Methods (May 30).
Photographing Children (June 6).
Portraits of Elderly People (June 13).
Something about Lenses (June 20).

HAND CAMERAS FOR PROFESSIONALS.

WHILE there is a large class of professionals, those who are almost exclusively engaged in Press photography, who use hand-cameras for the great bulk of their work, the majority look somewhat askance on this type of instrument, and are rather inclined to think it fit only for amateur snap-shots and judge its capabilities from the plates and films which from time to time are handed to them for development and printing. Judging from such material I can quite sympathise with those who regard hand-cameras as toys, but it must be borne in mind that the large proportion of failures are due, not so much to the shortcomings of the instrument; but to the inexperience of the user; and the skilled photographer will find that with a little study he can produce a very large proportion of successful negatives under conditions in which it would be difficult, if not impossible, to use a stand camera.

The selection of an instrument which will be really serviceable demands a considerable amount of care, and due consideration must be given to the class of work which will most likely be undertaken; therefore, I would counsel anyone who has not been accustomed to hand-cameras to get a little preliminary practice with a simple inexpensive article which he can supersede by a better one as soon as he has become fully conversant with its handling and has realised its shortcomings. I say this because I have known more than one who has purchased an expensive half-plate reflex and been bitterly disappointed with the work he has been able to get out of it, not because of any inherent fault in the instrument, but owing to its unsuitability for his purpose.

Although there are scores, perhaps hundreds, of different makes of hand-cameras upon the market, there are only a few well defined types, which are issued under various names by the makers. I will, therefore, give a brief description of such as I consider useful, indicating their strong and weak points, but before doing so it may be well to point out that a hand-camera is often at its best when fixed upon a stand, just as a celebrated author pointed out that he was never quite satisfied with his fountain pen until he discovered that it was a very good ordinary pen when he dipped it in the inkstand. This leads me to what I may call the intermediate class or "hand and stand" cameras, of which we may take the small "Sandersons" as the best known example. These closely follow the lines of the ordinary conical bellows field camera, but possess the advantage of having the lens and shutter so fitted that they need not be removed from the front when the instrument is closed, while there are no openings in the body to admit dust or moisture. Focussing is normally effected by scale, but a ground glass is provided so that until the user has attained some skill in judging distances, he can focus in the ordinary way upon near objects. A finder of the usual reflecting type is fitted, and this is sometimes supplemented by a direct vision finder which allows the camera to be used at the level of the eye as well as from somewhere near the waist line. I greatly favour this type for rapidly moving objects, as the object can be kept in view before it enters the field of the finder, and, moreover, it comes into the finder on the same side instead of the opposite one, as it does in the reflecting pattern.

Such cameras are usually provided with an effective rising front, and in most cases a vertical swing to the back. The swinging front of the Sanderson, of course, answers the same purpose, so that architectural and similar difficult subjects can be tackled with the same ease as with an ordinary stand camera. Other patterns of this type are the Sinclair Una, Ross's Keros, and Watson's Alpha. Many other makers issue a somewhat similar model on quarter-plate and smaller sizes, but for professional work I am inclined to recommend the half-plate as being the most generally useful.

Of hand-cameras pure and simple the collapsible pattern best known in pre-war times as the Goerz Anschütz is un-

doubtedly the best. A similar camera of British make is the Panros, and doubtless other makers will put this pattern on the market as soon as normal conditions of manufacture prevail. The body is extended to the infinity focus of the lens by a single motion, but near objects may be focussed by means of a spiral adjustment to the lens mount. The shutter is a focal-plane one, which will give very quick exposures with the maximum efficiency as well as longer ones, say 1-10 sec., while for stand work time exposures may be made either with the shutter or cap, the latter being perhaps the more certain, as even the best focal plane shutters are apt to give a slight shock on opening. When closed these cameras are very compact and generally stand rather rough usage very well. They have no swing back, but have, as a rule, both rising and cross fronts. Press work generally, postcard views, and occasionally home portraiture come within their scope. As the bellows is of a fixed length they cannot be used with wide angle lenses, and if telephoto or other long focus lenses are to be employed, the only way of doing so is by means of an extension body, which is rather a clumsy device. However, the camera used with its normal lens is one of the most useful which a photographer can possess.

The next to claim our attention is a totally different type, which can lay no claims to portability in any except the quarter-plate size. It is the reflex in which the image is received upon a mirror placed at an angle and diverted to a focussing screen on the top of the body, while the plate is protected by the focal plane shutter at the back. On pressing the release the mirror springs out of the way and the shutter is at the same time released. The strong point of this construction is that very accurate focussing can be done at large apertures, hence it is useful for all classes of natural history work, child studies, and home portraiture. It is little used for Press work on account of its bulk and the fact that it cannot be conveniently used at the level of the eye. There are several models of folding body reflex cameras which are less bulky to carry, but they are more likely to get out of adjustment than the box form, and I do not recommend them for professional use.

An older type of reflex is known as the twin-lens camera. In this the mirror is a fixture and the body is divided into two sections, each fitted with an identically similar lens, the upper being used for focussing only while the lower is provided with a shutter for exposing. In some respects they are superior to the single-lens reflex as the image is visible the whole time, and there is no interval between the pressing of the release and the movement of the shutter, but their still greater bulk and the expense of a second lens has caused them to go out of fashion. It may be said that a cheaper lens could be used for the focussing finder, but after many experiments I was forced to the conclusion that to get the best results the two lenses must be identical in construction. Another failing is that with near objects there is a discrepancy between the view in the finder and that upon the plate, that is if the adjustment has originally been made for infinity.

Kodaks are generally regarded as purely amateur cameras, but when skilfully used are capable of really good work. The cheaper grades are naturally limited in their scope by the slowness of the lenses with which they are fitted, instantaneous exposures at *f*/8 even being only possible in a good light. When supplied with rapid anastigmats much greater possibilities are opened up, and the photographer who wishes to carry a hand camera which needs the minimum of space will do well to give the Kodak a trial. The 3a or postcard size will be found the most useful. In this connection I must not forget that British-made cameras of this pattern are issued by Messrs. Houghton and Butcher and Sons, under the name of Ensign and Carbine respectively, also fitted with anastigmat lenses.

Very small cameras of the Blocknote and Vest-pocket types possess but little interest for professional workers, although the late Mr. Essenghigh Corke has recorded in these pages how they have stood him in good stead when larger instruments were impossible, but as a general rule too great a degree of enlargement is necessary for them to be generally useful, as it is usually necessary for the prints issued to compete on equal terms with direct work, and with most rapid plates the grain of the emulsion precludes this.

Now a word as to lenses. A hand-camera which can only be used in the best of light is of very limited utility, therefore I would say that whenever possible a lens with a maximum aperture of *f*/4.5 should always be chosen if possible. It is not always necessary to work at full aperture, in fact, it is better to stop down as much as it is safe to do, but there are times when the large aperture is badly wanted, when it turns thoroughly dull just as the Royal or noble party arrives at the fete, or when the conclusion of the sports is deferred and the best of the light is gone; then is the time when the 4.5 lens begins to earn money. Of late years fixed focus telephoto lenses of large aperture such as the Telecentric and the large Adons have come on the market, and these will often be found useful for cricket matches, sports and the like. It is necessary with these on account of their focal length to focus very accurately so that they should only be used upon reflex cameras or those fitted with a focussing screen, scale focussing with say a 16 in. lens being very difficult, if not impossible.

It is wise to provide oneself with a light stand for slow instantaneous exposures; few people can keep a camera absolutely steady for a tenth of a second, and fewer still for a fifth, yet there are many subjects which are only possible with such exposures, and they are rendered easy if a stand is available. It may be thought that there is no time to use it, but if the camera is fitted with a direct vision finder, the whole affair can be dropped down and the exposure made in two or three seconds.

As the exposures in hand-camera work will in many cases be on the side of insufficiency, every precaution must be taken to make the best of them, that is to say, that the most rapid plates should be selected, that they should be quite fresh and that every precaution should be taken against fog in the dark room. Development will also be somewhat different from that of fully timed exposures. There is always a tendency to over-develop under-exposed plates and this only results in the high-lights becoming too dense without any addition to the shadow detail. It is a good plan to use a developer diluted to half its usual strength and to develop only a little longer than for ordinary exposures, this will give a rather thin negative which will print very well upon a suitable paper, but which may be intensified if necessary. If this be done the shadow detail will also gain in density, which is not the case if full density be obtained by development. Another useful tip is to use backed plates; one never knows what position the subject will happen to take, and if it happens to be against the light a failure is certain with unbacked plates, for extra rapid emulsions are very transparent and allow much light to pass through. PRACTICUS.

THE WAR SAVINGS ASSOCIATION in connection with the firm of Rajar, Ltd., Mobberley, have collected £8,228 11s. in Certificates and Bonds up to the end of March, 1919, with an average membership of 115.

MR. A. S. RAY is now calling on all photographers in Great Britain in the interests of Monomet and other photographic chemicals manufactured by the White Band Manufacturing Co., Ltd.

SILVERING MIRRORS.

Apart from its usefulness, silvering glass is a most fascinating process. There are numerous formulæ, and I have tried most of them. Nothing in my trials gives the highly brilliant deposit that sugar does. I take

Castor sugar	1 lb.
Tartaric acid	1 oz.

put into an enamelled saucepan, and just cover with rain or distilled water. Bring to the boil; when cool, make up to 60 ozs. solution and add 5 ozs. alcohol, the more rectified the better. This and subsequent solutions keep indefinitely, but should not be used fresh. Now take a 5 per cent. nitrate silver solution which has been precipitated with ammonia, and just cleared. Of this, use, say, 2 ozs.; precipitate again with some caustic soda or potash solution of 10 per cent. (about ½ to 1 dram is sufficient); just clear again with ammonia, and add ½ of its bulk of the following:—

Sugar stock solution	1 oz.
Rain or distilled water	10 ozs.

This should be added just at time of silvering the glass, which takes two to three minutes in a temperature of 80°. If the first application does not give density enough, a second can immediately be given by pouring off the old one and applying the fresh one. This gives a beautiful, highly-polished film, and is tenacious. There is no need of the tremendous purity of chemicals one sees insisted upon. Mr. Crowther's article in a previous "B.J." is similar to the above. A variety is to add 10 drops of 40 per cent. formaline to the stock sugar solution. This gives a tremendously thick silver without bloom, and is perhaps more advantageous than using formaline alone. In using formaline alone it is surprising what a small amount is required. 10 minims in 10 ozs. water is usually sufficient; this, however, does not work so smoothly or brilliantly as sugar.

In cleaning the glass, a 10 per cent. solution of tin chloride is the most useful to use, giving the glass a "bite" and getting rid of all grease. I have used this solution for years for other purposes, and find it excellent.

Rochelle salts as a depositing agent, unless pure, is not so satisfactory, and takes a long time to deposit. The most messy formula is that of oil of cassia and clove. I did not find methyl violet dye, as given in a recent formula, of much advantage, tending to discolour the silver; also there is no advantage in retarding the deposit. Excessive alcohol gives films rather transparent and of a violet colour when looked through. In a temperature of 80°, silvering of glass is absurdly simple.

W. W. Wall (Ceylon).

Photo-Mechanical Notes.

Why Do Engravers Use Wet Collodion?

Wet collodion is a beautiful process, but so it always was, and yet it has been displaced by dry plates in every department of photography except photo engraving. How is this?

The engravers will perhaps say that the results are better, but do they not deceive themselves? Results equal to wet plate can be produced on suitable process dry plates, though the negatives themselves may not look quite so attractive. But then the negative is not the end itself, as the operator so often appears to think, but a means to the end. Much difficult copy that is impossible to wet collodion is easy to dry plate.

It is sometimes said that wet collodion is cheaper. This also is very doubtful if account is taken of all the expenses in connection with collodion, the glass always much larger than the picture, the preparation of the plates, the time taken in preparation, the extra chemicals, the extra space required, the extra wear and tear of apparatus due to the use of corrosive material, the extra fire risk on account of the inflammable nature of collodion, etc.

Again, it may be said that collodion is quicker. If this is so, the Press photographer's attention should be called to it, and it is remarkable that the military authorities did not turn to it—with dry-plates our air force photographers managed to develop their exposures and deliver prints in an incredibly short time. Joking aside, it is possible the wet-plate man can make a record speed if you give him a plate ready for exposure, but if you include the time taken to first clean the glass, coat it, sensitise it, then add the extra time necessary for exposure, the wet plate will be hopelessly slower. Moreover, wet plates must be separately and individually handled throughout, whereas dry plates can be handled in batches, which is a tremendous economy of time if one has sufficient work to do.

Many methods have been devised or suggested for systematising exposure. Why not carry this a step further and use a material that would enable development and printing to be systematised also? While the writer is firmly of opinion that ultimately dry plates will displace wet collodion, there seems small prospect of it at present, and he is like most other engravers everywhere, using wet collodion except for difficult work that wet collodion will not do—when he has to turn to dry plates.

Engravers are conservative craftsmen, and not until they begin to make exposures direct on metal in the camera (which they will be forced to do sooner or later, probably by the photo-lithographers, and because customers insist on more and more speed), will they give up their beloved messy old silver bath, and take to a ready-prepared sensitive material. Then, although they will be getting results better than ever, they will still regretfully refer to the "good old days" when quality that has since disappeared was always found because wet collodion was in vogue.

Standardising the Etching Time.

A want of uniformity is one of the most undesirable characteristics of all photo-mechanical operations, and nowhere is this want of uniformity more apparent than in the etching department. With a uniform negative a definite time in the etching bath should give uniform tone and uniform depth of etching. This assumes, however, that the conditions of etching are standard, that the manner of etching is kept the same, whether face up or face down, bath rocked or still; that the temperature of the etching solution is kept even, and that the strength of the etching solution is uniform. This latter point, perhaps, presents the most difficulty because the strength varies according to the amount of metal etched. It is probable that a good plan would be to take a certain quantity of solution at a certain hydrometer strength and allow so many square inches to be etched all at the same time in such a bath and then throw it away. Of course, this is not very easy to arrange in the average photo-engraving shop, where each job is wanted at once and many have to be done individually. A plan that has been adopted, which, we are told, works with tolerable success, is to make up the bath of perchloride of iron to 34 degrees Baumé. At the beginning of every day about one-fifth of the bath is removed and replaced with fresh solution at 40 degrees, the bath tested and diluted with water if it registers more than 34 degrees. Unless there is some use for the spent solution, this may seem a little extravagant, but it is worth it, for the certainty that a plate left in the bath so long will be sure to be etched as much one day as another.

Exhibitions.

PHOTOGRAPHS BY N. E. LUBOSHEZ.

There is now on view at the Royal Photographic Society a one-man exhibition of photographic portraits by Mr. N. E. Luboshez, the object of which is to show the possibilities of pure straightforward photography. Most of the examples shown were taken in front of audiences during demonstrations on lighting at various photographic conventions. Some were taken in ordinary rooms, and a few were taken in studios of well-known photographers to demonstrate either flashlight or some particular form of electric light. The exhibits show in a very striking manner the possibilities that are open to any photographer who thoroughly understands his medium. It should be noted that neither the negatives nor the enlargements have been touched up in any way. They are absolutely straight enlargements from straight negatives. The exhibition opened on June 23, and will close on Saturday, July 12. Admission is free on presentation of visiting card.

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

LIVING PORTRAIT CAMERAS.—No. 14,654. Cameras for making changeable pictures. Animated Picture Products Co. and E. C. R. Marks.

CINEMATOGRAPHY.—No. 14,811. Cinematograph rotary shutter. N. S. Dawes and M. E. Horsman.

COLOUR PHOTOGRAPHY.—No. 14,631. Colour photography. W. Friese-Green and L. O'Malley.

HALF-TONE SCREENS.—No. 14,996. Method of producing screens for production of half-tone negatives. W. R. B. Larsen.

CINEMATOGRAPHY.—No. 14,982. Apparatus for taking or exhibiting cinematograph pictures. H. R. A. Mallock.

CINEMATOGRAPHY.—No. 14,593. Shutters for cinematograph apparatus. J. Urquhart.

COLOUR STEREO-CINEMATOGRAPHY.—No. 15,015. Stereoscopic cinematography with colour effect. S. D. Williams.

COMPLETE SPECIFICATIONS ACCEPTED.

These specifications are obtainable, price 6d. each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

MAGNESIUM LAMP.—No. 120,736 (May 15, 1919). This invention relates to a magnesium lamp for photographic use, and in which, for ignition of the light-producing powder, is used an ordinary match, which is struck against suitable striking composition.

The characteristic features of the invention consist in the placing and displacement or turning of the match; while all the other parts of the mechanism may be varied in many different ways.

In the drawings,

Figure 1 shows a form of lamp in side view ready for use.

Figure 2 is a detail of the match-holder.

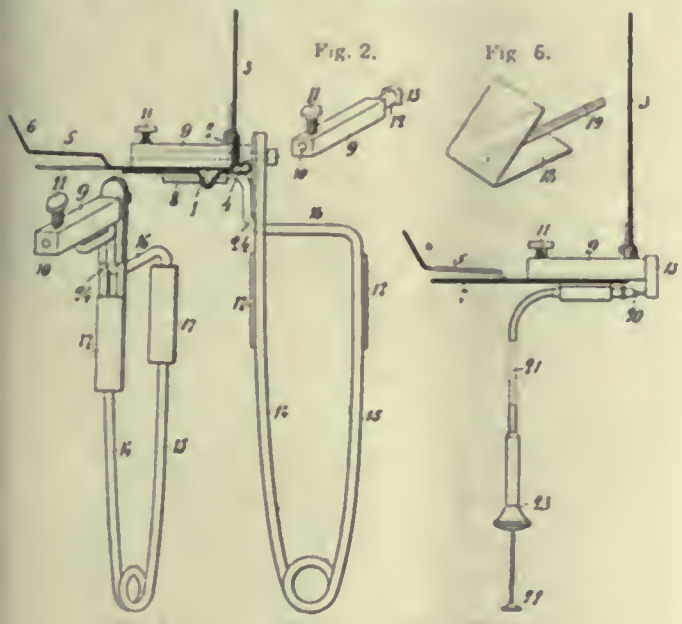


Figure 3 shows the lamp in plan view.

Figure 4 is a side elevation of another form of construction of the lamp.

Figure 5 is a perspective view of the arrangement of the match-holder on the mechanism.

Figure 6 illustrates the placing of the match in the striking composition.

The lamp itself consists of a plate 1, which is horizontal when in working position, with a bent rear edge 2, upon which the back plate 3, which is vertical when in working position, is fixedly mounted and kept fast in the open position by a pair of leaf-springs 4.

The front part 5 of the plate 1 is stepped upward and provided with an upstanding outer edge 6. In the middle of the member 5 is stamped out a tongue 7, which is below the level of the

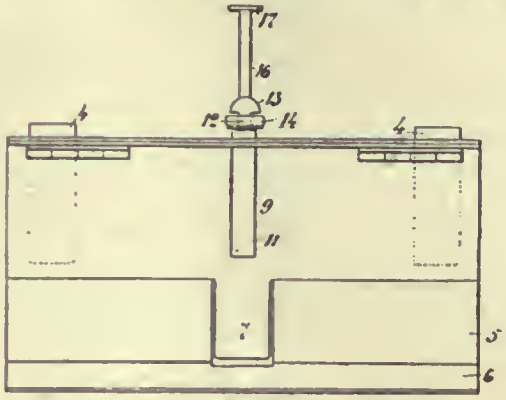


Fig. 3.

member 5, so that by this tongue and the surrounding edges of the member 5 there is formed a holder, which may be of a yielding character.

On the underside of the plate 1 there is arranged near the rear edge 2 a hoop 8 for receiving the end of limb 15 of the handle 14-15 and across the upper side of the plate lies a match-holder 9, which, in the form of construction now being described, is square, and so arranged that it may pass through a corresponding hole in the rear edge 2. The holder 9 has a through hole 10, so that the device may be cleaned, and carries a screw 11. The rear end of the holder 9 has a cylindrical neck 12 and a head 13 of rectangular form.

The handle consists of a V-spring, the two limbs of which are designated 14 and 15 respectively. The upper part of the branch 15 has a bend 16, which engages with a slot, formed by the limb 14, after which the end of the bend 16 is bent up at 24, while the outer end is arranged to co-operate with the hoop 8, so that the plate 1 may set fast on the handle. As an alternative it is obvious that the portion 24 of the limb 14 might co-operate with a hoop attached to the back plate by giving same a slight bend to one side.

The upper end of the limb 14 is likewise bent, and forms a slot for the head 13 of the match-holder 9.

The limbs 14 and 15 may have a pair of finger plates 17 to conveniently manipulate the handle.

The apparatus acts in the following manner:—

The back plate 3 is put up, so that the holding springs 4 keep the plate in the vertical position. The holder 9 is pushed back, and the slot in the limb 14 is passed over the head 13, with the holder in the horizontal position.

When the head 13 has come behind the slot, so that the sides thereof embrace the neck 12, the holder is turned into the vertical position, and the end of the branch 16 is pushed into the hoop 8 This position is shown in Figures 1 and 3.

The bent striking composition member 18 is now placed in the clip between the tongue 7 and the plate 5, and the plain end of a match 19, which is introduced between the two pieces of the striking composition, is pushed into the match-holder 9 and is clamped fast by the screw 11. Light-producing powder is then placed on the plate 1 above and around the holder 9, and in such a manner that there is plenty of powder at the place where the match 19 leaves the hoop of the striking composition 18.

The apparatus is now ready for use, and in such a way that the limbs 14 and 15 are pressed together, or, rather, the limb 14 is pressed up against the limb 15; the head of the match 19 is drawn out of the striking composition 18, which yieldingly embraces the head, and as the match catches fire it will at the same time ignite the powder lying on the plate 1.

When the apparatus is not used, the handle 14-15 is removed,

and is, together with the match-holder 9, placed on the plate 1, after which the plate 3 is shut down. The whole apparatus takes up but little room, and is easily transportable.

Instead of the head 13 any other means of connection between the holder and the spring-branch 14 may be used.

In Figure 4 is shown a modified form of construction for the actuating of the match-holder 9, which has in this modification behind the back plate 3 a head 13, but this co-operates with a pin 20, which, by a Bowden release 21, is in connection with a press-knob 22 and corresponding handle 23, so that the pin 20 may be pushed forward, which movement is transferred to the head 13, and therefrom to the match-holder. By this arrangement the handle 14-15 is superfluous, and the lamp may then be worked at a distance, as the Bowden release may be of any length. Moreover, the lamp may be arranged to be used as well with a handle as with a Bowden release, as might be preferred, in that the Bowden release may be arranged to draw instead of to pull; its front part (the wire and the end of the spiral) may then be fastened respectively to the head 13 of the match-holder and to an elongation upwards of the handle-branch 15.—Jens Peter Hansen, Jacobys Allé 10, Copenhagen, Denmark.

Trade Names and Marks.

TRADE MARKS REMOVED FROM REGISTER.

In the official language of the "Trade Marks Journal" the following trade marks have been "removed from the register through non-payment of renewal fees." Such non-payment is, of course, the method adopted by a firm having no further occasion for the use of a mark :—

EIDELER.—No. 270,903. Registered by R. and J. Beck, Limited, in 1905. (Class 39).

EIDELER.—No. 270,902. Registered by R. and J. Beck, Limited, in 1905. (Class 1).

EIDELER.—No. 270,498. Registered by R. and J. Beck, Limited, in 1905. (Class 8).

MATTOS (DESIGN).—No. 270,712. Registered by Mattos, Limited, in 1905. (Class 39).

MATTOS (DESIGN).—No. 270,711. Registered by Mattos, Limited, in 1905. (Class 1).

IDENTO.—No. 270,884-85. Registered by A. L. Adams, trading as Adams and Co., in 1905. (Class 8).

BROMIRES.—No. 271,542. Registered by the Rotary Photographic Co., Limited, in 1905. (Class 39).

LIVING PICTURE (CAMERA DESIGN).—No. 271,675. Registered by G. H. Garner, trading as the Living Picture Series Co., in 1905. (Class 39).

APPLICATIONS FOR REGISTRATION.

WIP.—No. 390,174. Cinematograph projectors, cinematograph cameras, and cinematograph apparatus. Thomas Edward Carnal Wheeler, 9, Cecil Court, Charing Cross Road, W.C.2., manufacturer. April 14, 1919.

REGISTRATION RENEWED.

POCO.—No. 272,792. By Kodak, Limited, in 1905. (Class 8).

Analecta.

Extracts from our weekly and monthly contemporaries.

Photographic Printing on Wood.

A SIMPLE formula for printing photographs on wood from reversed negatives (says "The Process Engravers' Monthly" for June) is the following:—

The sides of the wood block are rubbed with heated wax or paraffin. This is to keep moisture from injuring the wood. Three solutions are kept in stock ready for use:—

1. Gelatine, 16 grs. to 1 oz. of water.
2. Silver nitrate, 80 grs. to 1 oz. of water.
3. Citric acid, 40 grs. to 1 oz. of water.

The white of an egg is beaten to a froth and left standing over night.

To sensitise a block, take: White of egg, 1 dram; gelatine solution, ¼ dram; best zinc white, ⅛ oz.; ammonium chloride, 5 grs. Rub these to a paste in a glass mortar, and while rubbing drop slowly into the paste 30 minims of the citric acid solution and 30 minims of the silver nitrate solution. Paint this on the wood block very thinly, seeing to it that the block is completely covered. Dry quickly in the dark and print under negative as usual, timing the print so as to keep a record of what length of time is best, which will vary with different negatives and different lights. Fix the print in the dark-room by holding it face down for a few minutes in a tray of hyposulphite of soda. Wash the hypo from the face of the wood quickly and remove the moisture with damp chamois or blotter. Dry quickly. This will give a brilliant print with no film to interfere with the gravers. The wood is not injured by chemicals if care is used to wet only the surface of the block.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

SATURDAY, JUNE 28.

Hackney Photographic Society.—Annual Sports.
Chelsea Photographic Society. Outing: Kingston to Richmond.
Liverpool Amateur Photographic Association. Outing to Cheetham Hospital Manchester.
South London Photographic Society.—Excursion to Strand-on-the-Green and Kew.
North Middlesex Photographic Society.—Ladies' Outing to Beckenham.
Manchester Amateur Photographic Society: Outing: Bramhall to Adlington.

MONDAY, JUNE 30.

South London Photographic Society.—"Personal Practice in Pictorial Printing." E. C. Perry.

TUESDAY, JULY 1.

Manchester Amateur Photographic Society. Beginners' night, "The Equipment of the Dark Room." Messrs. Chapman, Crowther, and Pullen.

WEDNESDAY, JULY 2.

North Middlesex Photographic Society. Platinotype. A. H. Lisett.

THURSDAY, JULY 3.

Hampshire House Photographic Society. "Bromide Printing and Enlarging. M. O. Dell.

PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

A MEETING of the Council was held on Friday, June 13. Present: Messrs. A. Basil, Gordon Chase, C. F. Dickinson, A. Ellis, S. H. Fry, R. Haines, Lang-Sims, R. N. Speaight, H. A. St. George, and F. G. Wakefield (London members), and Marcus Adams (Reading), T. Chidley (Chester), W. Illingworth (Northampton), and F. Read (Southport).

The minutes of the previous meeting were read and confirmed.

Letters of regret for non-attendance were received from Messrs. Alex. Corbett (London) and W. B. Chaplin (Windsor).

The Hon. Sec. reported that No. 13 of the new issue of the P.P.A. Circular had been issued to the members. As secretary he had received the full average number of letters of inquiry for the advice and assistance of the Association, and these had been duly dealt with. Amongst these inquiries was one complaining of the action of a firm who advertised photographic sundries, and from whom neither goods nor a refund of money could be obtained. The Association had now a definite promise from the firm in question, and it was hoped that the matter would be settled without recourse to legal process. (A member of the Council had had similar trouble with the same firm.) Another complaint was the not uncommon one of breakage of negatives in the post. Correspondence had followed with the Postmaster-General, who insisted that the Post Office rule, that if the outside of the package was intact and in good order, it was to be assumed that any damage to fragile goods inside (and photographic glass plates must be included in that category) was due to defective or insufficient packing, must hold good. The utmost care and the use of sufficient and suitable packing must be the antidote to the rough usage by the Post Office servants. Many other complaints of a more or less special character had been investigated, including one from a member whose fellow-townsman was—he alleged—showing specimens in his showcase which were not produced in his own studio. As the photographer complained of was known to more than one member of the Council, the consideration of this complaint was deferred until more personal evidence could be produced at the next Council meeting.

It was further stated by a member that he believed one firm in the West End was undertaking to supply "portrait specimens" to any intending photographers who bought photographic apparatus or outfits from them. Further information was promised.

Mr. Marcus Adams presented the report of his committee (Haines, Lang-Sims, Speaight, and Wakefield) on the question of assistants. After careful consideration the following resolution was passed unanimously:—

"That this Council of the Professional Photographers' Association, believing it would be to the general advantage of professional photography that assistants should have an association of their own, urge them to form one, and are willing to provide the sum of ten pounds to a responsible committee towards the initial expense."

Mr. Wakefield informed the Council that he, with Mr. St. George (the President) and Mr. Haines, had interviewed the secretary of the London Trade Association, referred to in the last minutes, and had inspected the premises, which had been suggested as suitable for London offices of the P.P.A. He hoped soon to have a definite offer to place before the Council, which would provide both premises and clerical assistance, use of telephone, etc. The further consideration of this very important and far-reaching change was deferred until the next meeting.

Mr. Speaight briefly introduced the subject of the provision of a certificate of membership, which could be framed and displayed in photographers' places of business. This, and Mr. Illingworth's postponed proposition upon the advisability of incorporating the P.P.A., was adjourned until the next meeting on July 11.

LANCASHIRE SOCIETY OF MASTER PHOTOGRAPHERS.

The first meeting of the newly-elected committee of the Society of Master Photographers was held at the office, 39, Blackfriars Street, Manchester, on Tuesday, June 17. A very large number of members were present from all parts of Lancashire and Cheshire, and the meeting was presided over by Mr. F. Kenworthy, the president.

The minutes of the previous meeting having been read and confirmed, the secretary's report with reference to the exhibition held at Blackpool was submitted for adoption. Reference was made to a letter that appeared in the "B.J." for week ending June 14, and signed by one describing himself as "Hopeful." There were some very strong feelings expressed regarding this writer and the uncharitable attitude he had taken up regarding the exhibition. It was, however, decided to treat the letter with the contempt it deserved, the writer not having had the courage to sign his name to the same. Financially, both the exhibition and the annual dinner have been a great success, and a small balance was left after all expenses had been paid. The result of the ballot was as follows:—Section 1 (studio work): 1st prize, Ralph Jones, St. Annes-on-sea; 2nd prize, Mr. Rudini, Blackburn; 3rd prize, N. S. Kay, Manchester. Section 2 (artificial light): 1st prize, N. S. Kay, Manchester; 2nd prize, C. E. Willis, Bolton; 3rd prize, N. S. Kay, Manchester. Section 3 (commercial photography): 1st prize, W. T. Carter, Rochdale; 2nd and 3rd prizes, C. E. Willis, Bolton. Section 4 (colour work): 1st prize, N. S. Kay, Manchester; 2nd prize, C. E. Willis, Bolton; 3rd prize, Mr. Care, Eccles. The question of the nature of awards to be given to the winners was then discussed, and it was decided to ask the exhibition committee to deal with this matter and bring forward their recommendations at the next committee meeting.

A very important matter was then discussed regarding assistants leaving without notice, and at the invitation of the president, Mr. J. S. Brown attended the meeting in order to explain to the committee how he had been treated by a member of his staff quite recently. He had left this individual in charge of his business during his absence at the conference in Blackpool, and on returning found that his studio had been closed for two days, and the assistant in question informed Mr. Brown upon his return that she had no desire to return to her work. In consequence of this action Mr. Brown was very much inconvenienced. Mr. Howell quoted a case of a youth at the age of 17 years whom he had engaged quite recently at 45s. per week. After receiving his money on the Saturday, he informed one of his fellow workers that it was not his intention to return. He was then asked if he did not think Mr. Howell was entitled to a week's notice. His reply was that that was the seventh job he had had in seven weeks, and had not given notice to any one of them. Several cases were quoted by members of assistants having been engaged from different parts of the country and their expenses paid on the understanding that they were perfectly qualified. It was discovered, however, when work was placed in their hands, that they were utterly incompetent, and on several occasions many pounds' worth of work had been spoiled. The question having been discussed at some great length, and many members having given their experiences, the president stated that he considered the time had arrived for some drastic measure to be taken by the members of the society. He would suggest that the secretary be instructed to draft an agreement which could be submitted to the next meeting of the committee, and, if approved, this should be used by every member of the society. Mr. Winter proposed the adoption of the president's suggestion, and would embody in his proposal that the secretary be instructed to retain the services of a solicitor to take up Mr. Brown's case, and, if necessary, to take it into the Court and make a test case of it. Also, that the secretary approach several solicitors with a view to making arrangements for retaining the services of a professional man to watch the legal interests of the members of the society. This proposal was seconded by Mr. Howell and carried unanimously.

The question of sick pay was also fully discussed, and several members gave their experiences with regard to this matter, it being decided after a lengthy discussion that the secretary embody a clause in his draft agreement to govern this question.

Assistants' specimens. This question, the president reminded the members, had been brought forward by Mr. N. S. Kay, the past president, in his address at Blackpool, and the members would remember that he stated a very clear case of how an assistant had traded upon the work of Mr. Kay and had tried to pass it off as his own. Mr. Kenworthy stated that he had given this matter a great deal of thought since the annual meeting, and he would suggest that the assistants be allowed a set of specimens before leaving the employment of any member, these specimens to be secured from time to time by the assistants and submitted to the employer, and if the employer was satisfied that it was the work of the assistant, he, the employer, should sign the specimens accordingly and forward them on to the secretary of the society to be endorsed by the seal of the society. On an assistant leaving the employer, a covering letter should be given to each assistant intimating that the specimens submitted were the work of that assistant. This letter should also bear the crest of the society. It was generally felt that the suggestion of the chairman was a very practical one and would help them considerably to do away with the practice that had been outlined at the annual general meeting by Mr. Kay, and that the adoption of the chairman's suggestion would be for the benefit of every practical assistant as well as for the employer. Mr. Greswell then proposed that the chairman's suggestion should be adopted, this proposal being seconded by Mr. Beck and carried unanimously.

A letter from the secretary of the Birmingham Photographic Society was read by the secretary, in which information was asked regarding the attitude that had been taken up by the members of the Society of Master Photographers with regard to the proposed scheme of the Ministry of Labour for training disabled soldiers, and after a very lengthy discussion the secretary was instructed to write to the Birmingham Photographic Society informing them that at a general meeting of the Society of Master Photographers held some time ago it was unanimously decided that the scheme of the Ministry of Labour with regard to the training of disabled soldiers could not be encouraged in consequence of the very short training suggested, it being considered that at least five years should be spent by an apprentice in order to learn his profession properly.

The question of members' certificates was brought up by Mr. F. Read, and it was decided that these certificates should be put in hand, and the exhibition committee should be asked to pass a draft proof of same.

The committee decided to hold their regular monthly meetings on the third Tuesday of each month at the office at 39, Blackfriars Street, Manchester, and general meetings of the society to be held

from time to time in different parts of the Lancashire and district area.

A vote of thanks having been proposed to the president, this concluded the business of the meeting.

Affiliation of Photographic Societies' Summer Outing.—The removal of all restrictions on photography and the return of so many men to civilian life and pursuits resulted in a large attendance, and the outing on June 21 in the Croydon district was characterised by much of the enthusiasm and cheerfulness of pre-war gatherings. The weather was very favourable for outdoor work, which was only suspended for a short time while a thunderstorm passed over about midday. This caught one eminent pictorialist on the top of Crohamhurst, searching for "the spirit of June," and considerably damped his enthusiasm by soaking him to the skin. During the morning a number of plates were exposed in Whitgift Hospital, the old Archbishop's Palace, and the parish church. The afternoon trains brought down heavy reinforcements from town, which spread themselves over the route along the Wandle from Croydon to Wallington, where they were eventually all gathered together for tea, with the assistance of Croydon Camera Club guides. On the conclusion of tea the chairman of the affiliation, Mr. T. H. B. Scott, addressed the meeting, and reminded those present that the insignificant river they had wandered by bore a name which was an emblem of hope to the nation at the darkest period of the submarine menace, as the first U-boat successfully engaged by a merchant vessel was the one sunk by the little collier "Wandle," which received a most enthusiastic ovation when she came up the Thames to her wharf at Wandsworth. He referred to the desirability of a closer bond of sympathy and co-operation between the affiliation and the northern Federations, and in connection with this expressed the appreciation of the meeting at the presence of Mr. F. G. Mott, of the Yorkshire Photographic Union. He concluded by moving a vote of thanks to the Croydon Camera Club for its successful arrangement of the outing, which was responded to by the president of the club, Mr. John Keane. Mr. F. G. Mott cordially reciprocated the chairman's remarks as to the prospect of a better understanding being encouraged between the northern and the southern photographic bodies.

Commercial & Legal Intelligence.

NEW COMPANIES.

Black Cat Studios, Ltd.—This private company was registered on June 11, with a capital of £1,000 in £1 shares. Objects: Photographers, etc. The subscribers (each with one share) are:—J. E. Pickup, 55, Rochdale Road, Blackley, Manchester, and T. L. Cooper, 54, School Road, Sale, Cheshire, antique dealer and photographer. The first directors are J. E. Pickup and T. L. Cooper. Registered office, 15, Market Street, Manchester.

F. W. Miller and Co., Ltd.—This private company was registered on June 13, with a capital of £5,000 in £1 shares. Objects: Enamellers and makers of articles of personal adornment, ceramic photographers, etc. The subscribers (each with one share) are:—F. W. Miller, Aylesbury Road, Hockley Heath, near Birmingham, manufacturer; A. Allen, 66, Nansen Road, Sparkhill, Birmingham. The first directors are F. W. Millar, J. W. Simcox, and A. Allen. Registered office, 68, Nansen Road, Sparkhill, Birmingham.

S. A. Chandler and Co., Ltd.—This private company was registered on June 17, with a capital of £5,000 in £1 shares. Objects: To acquire the business of photographers, picture framers, and stationers carried on at Exeter and Southampton by S. A. Chandler. The subscribers (each with one share) are:—S. A. Chandler, photographer, fine art dealer, and stationer, Beach House, Topsham; Mrs. S. Chandler, Beach House, Topsham. Directors: S. A. Chandler and Mrs. S. Chandler. Solicitors: G. H. Kite and Sons, Taunton.

United Kingdom Optical Co., Ltd.—This private company was registered on June 18 with a capital of £100,000 in £1 shares (50,000 7 per cent. cumulative preference and participating). Objects: To take over (a) the business carried on by the Crescent Lens Co., Ltd., incorporated in 1918, (b) all or part of the plant, tools, patents, etc., of George Culver, Ltd., incorporated in 1897, and (c) an exclusive licence to work the secret process for moulding spectacle lenses and the like now worked by or under the control of the Precision Lens Moulding Co., Ltd., incorporated in 1919; to engage the services of A. H. Emerson, of 2, Chase Court Gardens, Enfield, as an inventor and secret process worker, expert adviser, and skilled operator; to acquire the freehold factory at Mill Hill and fixtures therein, formerly the property of Carl Zeiss, of Jena, Germany, but recently acquired by Ross, Ltd.; and to carry on the business of manufacturers of and dealers in spectacles, eyeglasses, goggles, lenses, photographic, marine, astronomical, and scientific instruments, etc. Special clauses are inserted in the articles of association to ensure against foreign control and to comply with the Board of Trade requirements against trading with the enemy. No enemy may be a director, and not less than three-fourths of the board, including the chairman, must be British subjects resident in the United Kingdom. The subscribers (each with one ordinary share) are:—G. W. Bayliss, 124, Queen's Road, Finsbury Park, N., manufacturing optician; E. Culver, 42, Coolhurst Road, Crouch End, N., manufacturing optician. The first directors are:—F. W. W. Baker, Queen's Road, High Barnet (chairman), G. W. Bayliss, E. Culver, S. Culver, 2, Deane Mansions, Dennington Park Road, N.W., and A. H. Emerson, 2, Chase Court Gardens, Enfield, all manufacturing opticians. Qualification, £250. Remuneration of chairman, £200; of others, £100 each per annum. Solicitors, Snow, Fox and Higgieson, 7, Great St. Thomas Apostle, E.C.

News and Notes.

Signor Giuseppe Fornasari, general representative for Italy of Messrs. Rajar, Limited, Mobberley, England, on the proposal of the Under Secretary for War and Ammunition, has been appointed Knight of the Crown of Italy.

The Problem of Enlargements.—An interesting brochure under this title has been issued by the London News Agency Photos., Ltd., which puts the case for enlargement from amateurs' negatives in a forcible way. It is illustrated with blocks which show how three well-composed and quite distinct pictures can be made from one rather overcrowded negative.

Photographing a Mirage.—We have received from Mr. G. F. Quilter, of Ingatestone, an interesting photograph of a mirage effect seen on the 15th inst. Although there had been no rain for days, there was from a certain point the appearance of pools of water in the road, in which the reflection of certain objects could be clearly seen. Mr. Quilter has taken careful notes of distances, angles, the position of the sun, etc., which he is willing to communicate to any scientific investigator of the phenomenon.

Naval Photographs—The steps being taken to obtain a photographic record and collection of all ships which flew the White Ensign during the war now include an appeal to all photographers in the Navy to lend their aid. In an Admiralty Order just issued, to which the Admiralty desire that the utmost publicity may be given, it is stated that:—

1. It is desired to obtain as complete a collection as possible of photographs of all ships which flew the White Ensign from 1914—1918 for the Imperial War Museum and Admiralty Records, and for this purpose it is especially requested that all officers and men who have negatives of ships, actions, damages or incidents of interest in connections with the war will lend them to the Secretary of the War Museum for inclusion in the collection.

2. All photographs sent in will be acknowledged, and copies will be made from those which are considered suitable and the negatives returned without delay.

Those not used will be acknowledged and returned at once.

The above applies to:—

(a) Any official photographs which have not yet been sent to the Admiralty. Such photographs would be taken with service materials supplied free for the purpose, and the negatives would remain the property of the Admiralty.

(b) To photographs taken by officers with materials purchased at their own expense, whether from service sources or elsewhere.

3. As it is proposed to open for sale prints of all photographs in the

War Museum collection, it is requested that in cases falling under (b) the donor will state his agreement to this condition in a covering letter. The proceeds of such sales will be applied towards the cost of the Imperial War Museum. Apart from these sales, the copyright remains in the hands of the owner of the negative, and officers and men are free to dispose of it as they please, subject to the condition that the photo should first be submitted to the Commanding Officer who will decide whether it contains anything of a confidential nature which should not be disclosed.

4. Permission to dispose of photographs under the above conditions extends to all photographs whether taken before or after the armistice.

5. An enlargement or prints, as desired, will be included with each accepted negative on return in acknowledgment of the gift.

6. Glass negatives should be well packed in boxes—not merely between cardboard and wrapping—and addressed to :—The Director, Imperial War Museum, Photographic Depot (Naval Section), 12, Coventry Street, W.1.

7. The Admiralty desires that the utmost publicity may be given to this matter, and the order should be copied and circulated throughout the ship or establishment.

Correspondence.

. *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

. *We do not undertake responsibility for the opinions expressed by our correspondents.*

NEW SIZES OF PLATES.

To the Editors.

Gentlemen,—Seeing that the British plate manufacturers (very sensibly, I think) wish to gradually do away with some useless sizes of plates, I write to ask why not adopt the 10 x 14 in., 7 x 10 in., 5 x 7 in., 3½ x 5 in., and 2½ x 3½ in ? These sizes would cover all classes of work, and if the operator purchased the larger size and wished a smaller, all he would have to do would be to cut a plate exactly in half. If a smaller size yet, then cut exactly in half again, and so on down to the smallest (2½ x 3½) size. The two largest sizes give plenty of room for artistic work, and are sensible shapes.

The 5 x 7 is a fine stereoscopic and portrait size, and is convenient for all-round work. The 3½ x 5 makes fine postal cards, lantern slides, etc., while the 2½ x 3½ fills all the requirements for a pocket camera. Another advantage is that all these sizes correspond practically with the metric system, so that they would always fit the holders anywhere in the world. I explained this somewhat in the "American Annual of Photography" for 1919, but I think if you publish this in your excellent journal your readers will not be slow to see the advantages. Wishing you success,—I am, yours truly,

H. W. HALES.

95, Spring Avenue, Ridgewood, New Jersey, U.S.A.

LENSES.

To the Editors.

Gentlemen,—It is to be feared that the condemnation by "Practicus" of the use of the Petzval portrait lens (the usual portrait lens) for outdoor work may, if allowed to pass unchallenged, deter inexperienced workers from the use of an instrument which they possess, and which might be of great service to them. In the days of collodion I invariably used it for equestrian portraiture, and at the Haverstock Hill studio I had a background fitted up in the garden, and photographed many children, and sometimes adults, there for the benefit of the rapid outdoor exposure. Not in a single instance did I experience either flare or ghost. I also knew a photographer in the country who habitually used his portrait lens for outdoor portraits (he had no studio), groups, churches, and houses.

If "Practicus" has been troubled in the way he describes, it is probable that his experience has been not with the true Petzval lens but with that variation from it in which the elements of the back lens are reversed in position. As has been pointed out by Mr. Chapman Jones, lenses of this construction are particularly liable to furnish "ghost" images, as, indeed, might be looked for from the fact of there being three glass surfaces concave to and behind the diaphragm, instead of one as in the original Petzval.

"Practicus" also speaks of the portrait lens having a more deeply curved field than the rapid rectilinear—a fancy name for the lens invented by Steinheil and called by him the Aplanat. Here again, I think the writer must have had in mind the variation of the Petzval already mentioned. Some years ago I ordered for a brother photographer, from a maker of the highest standing, a lens similar to one that I had in use. On trying it in the camera before sending it off, I found that the field was more curved than in my own lens, and on examining the instrument I found that the back lens was of the reversed curvature kind. I sent it back to the maker and was supplied with a satisfactory lens of the same character as my own.—Yours faithfully,

W. E. DEBENHAM.

ASSISTANTS' WAGES.

To the Editors.

Gentlemen,—"An Employer's" letter of the 13th inst. in reply to my letter of May 30 appears to challenge some of my statements, and I consider it is up to me to substantiate the remarks in question. In the first instance I was not speaking for myself alone, but for assistants in general, against the unfair treatment and inadequate wages that have been and are still offered. If "An Employer" cares to look through the "Situations Vacant" adverts. for May he will come across the ones that prompted me to write my letter on this subject. Unfortunately I have not the copy with me of the "B.J." in which they appeared, but the case to which I allude in particular was for an "Operator-Retoucher," or "Operator Manager" for a "London Suburb" at £2 per week. Besides this, there were adverts. for bromide printers, also London, at the same salary; one was worded: "Good Bromide Printer," and another asked for a "Finisher-Retoucher able to operate," at the same highly remunerative salary. As regards keeping situations open for their pre-war employees, one employer I know personally promised to keep the berths open for his men when they enlisted. Those who have returned have been re-instated at a salary equivalent to their previous rate, and, moreover, he has retained his temporary staff of girls till they have been able to secure suitable situations elsewhere. These are the kind of employer one does their utmost for, putting their heart into the work. On the other hand, a certain employer agreed to accept his men back after their service with the colours. Those who did return were informed that he got on very well with female labour, at about half the price it would cost him were he to re-engage them, therefore he had no further need of their services.

Even before the war an all-round man never was paid the wage he deserved, although able to assist in all branches of the trade, but the specialist in operating, retouching, finishing, etc., could command a far better wage. Do employers ever stop to consider how useful the all-round man is? especially in a small studio, since he is able to take the work right through, start to finish, working for a low salary, simply because he is only a "general assistant." "Another Assistant" who writes in the "B.J.," June 20, appears to be an ex-service man, and judging from his letter has come in contact with the "War Products"; possibly had an experience of them whilst in the service; if so, he has my sympathy. I quite agree with "Another Employer" in a number of his remarks, but to quote them would trespass too much on the space provided for "Correspondence."

In concluding, I might say I fully agree with both "Another Assistant" and "Another Employer" in requesting "An Employer" to publish the hints he alludes to through the valuable pages of the "B.J." for the benefit of innumerable assistants who take a pride in the work they execute.—Yours faithfully

AN ASSISTANT.

FORTHCOMING EXHIBITIONS.

September 13 to October 11.—London Salon of Photography. Entries close September 2. Hon. sec., 5a, Pall Mall East, London, S.W.1

Answers to Correspondents.

SPECIAL NOTICE.

In consequence of general reduced supplies of paper, as the result of prohibition of the importation of much wood pulp and grass, a smaller space will be available until further notice for replies to correspondents.

Moreover, we will answer by post if stamped and addressed envelope is enclosed for reply: 5-cent. International Coupon, from readers abroad.

The full questions and answers will be printed only in the case of inquiries of general interest.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

G. S. S.—The "Salex" lens is one issued by the City Sale and Exchange, 81, Aldersgate Street, E.C.1. At the present time, second-hand lenses, except of the best makes, are worth about three-quarters of the present list price.

E. Y. E. N.—There have been one or two French books on the subject, and one issue of the "Photo-Miniature" series, but all are now out of print. In the "B. J." of January 17, 1917, an article on pinhole photography appeared which might be of some service to you.

W. W.—Bromide postcards can be burnished by hot rolling, although the gloss is not as good as that by stripping from glass. It is more like the satin surface of some bromide prints. We should think you ought not to pay more than 30s. to £2 for a second-hand burnisher.

B. W.—There is no practical advantage in forming the hydrochloric acid for the platinotype clearing bath by mixing chloride of sodium and sulphuric acid, nor in our opinion in adding chloride of sodium to the hydrochloric acid bath. There is no better clearing solution than dilute hydrochloric acid, and it is quite effective in removing iron salts.

G. H.—The arrangement you describe is that adopted in the Bergheim lens and is a very good one; both lenses are of the same focal length, positive and negative, and when in contact will not produce an image. This is done by separating them. A simple plano-convex lens of crown glass will also give good results. Everything depends on the amount of softness you require.

R. H.—As you will not be trading under your own true Christian name and surname it will be necessary to register. Forms for the purpose can be obtained from the Registrar of Business Names, 39, Russell Square, London, W.C. No licence is necessary if the change is merely one of transfer of ownership. If you add any other accessory for retail sale, then a licence will be necessary.

A. E. Thomas.—Your suggestion of a cylindrical lens to cure the marginal distortion is not practical as the definition all over the plate would be affected. The only remedy is to use a panoramic camera in which the lens points directly at each part of the field in turn. If you used a lens with a curved field and curved the film so that the ends came into focus, it would reduce the defect but might not quite cure it

W. A. J.—If, as you say, the lens of the V.P. Klimax is set to 24 feet, naturally an object at that distance will be the sharpest, and at other distances the objects will only be approximately sharp. So far as we know there is no rule which can be applied in your case. Your best course will be to examine the image of objects placed at different distances with the lens set at 24 feet. Of course, an exceedingly finely grained screen must be used.

N. N.—We do not undertake registration of trade marks which, we take it, is what you wish to do in reference to the portraits. For this you should apply for a circular of instructions to the Controller of Patents and Trade Marks, 25, Southampton Buildings, Chancery Lane, London, W.C. 2. This will have nothin to do with the copyright in the portraits themselves which, as you doubtless may know, is created automatically by the taking of the portraits and without any registration as formerly.

R. B. T.—1. The lamps should be about 8 ft. from the floor for standing figures, and 6 ft. 6 ins. for sitting. If you want rapid exposures, at least another 1,000 c.p. is necessary. With such large reflectors a white diffuser, say 12 ins. square, should be enough. 2. You do not give size of plates you intend to use. Seven inches is far too short a focus for half-plates; at least 9 ins. is necessary to get good perspective. F/6.8 is a rather small aperture for artificial light. White walls will help to shorten exposure, but beware of flatness. The sloping roof will be of no advantage. It will not reflect light where it will be of any use.

A. M. G.—We are not surprised that you are not satisfied with the results which you obtain with the lens you mention. This we find has a focal length of 6 ins., quite suitable for general work, but far too short for 5 by 4 portraits. You mention 1½ ins. as the maximum size of head you require. Now, considering that in life a head averages 9 ins. in height, you want a reduction to 1·6th scale, and the distance between lens and sitter for this has to be seven times the focal length—in your case 3 ft. 6 ins. This is much too short, the minimum allowable distance being 5 ft., which would call for a 9 in. lens; 10 ins. would be better. You need not change your camera, but you should certainly change the lens, or else get an additional one of the necessary focal length.

C. H. E.—1. You might be able to procure a *very* pale yellow "pot metal" glass from Messrs. J. Hetley and Co., Soho Square, London, W.1, but we think your best course would be to fix only an ordinary plate without exposing and dye the gelatine a very light yellow tint. This you can do with Judson's or other similar dye. If you have a pronounced yellow it will, of course, prevent all action on the bromide paper. We do not think you will gain anything by using green or blue glass for dense negatives, but in the same way you could dye plates in these colours for trial. 2. The K2 filters are made by the Wratten division of the Kodak Company, Ltd., Kingsway, W.C.2, who will send you full particulars and prices. The filters may be used in front of the lens, but as a rule are better placed behind it.

The British Journal of Photography.

Line Advertisements.

Charges for Insertion.

Since advertisements cannot be inserted until fully and correctly prepaid, senders of line announcements are asked to bear in mind the scale of charges. They will thus save themselves delay in the publication of their announcements. A Schedule by which an advertisement can be correctly priced will be sent on request.

Net Prepaid Line Advertisements.

12 words or less 1/-
Extra words ... ... 1d. per word.
(No reduction for a series.)

Special Note. Box Number Advertisements.

"Box No." and office address ... ... charged as 6 words.
For forwarding replies add ... 6d. per insertion for each adv't.
If replies are called for this latter charge is not made.

Advertisements cannot be inserted until fully and correctly prepaid.

Orders to repeat an advertisement must be accompanied by the advertisement as previously printed.

Advertisements are not accepted over the telephone or by telegram.

The latest time for receiving small line advertisements is 12 o'clock (noon) on Wednesdays for the current week's issue.

Displayed Adv'ts should reach the Publishers on Monday morning.

The insertion of an Advertisement in any definite issue cannot be guaranteed.

HENRY GREENWOOD & CO., Ltd., Publishers, 24, Wellington Street, Strand, LONDON, W.C. 2.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3087. Vol. LXVI. FRIDAY, JULY 4, 1919. Price Twopence.

Contents.

	Page
Ex Cathedra	377
Stereoscopic Photography.—IV. "Giant Vision"	378
How to Prepare Photographic Solutions. By J. I. Crabtree	379
Practicus in the Studio. By Practicus	382
Forthcoming Exhibitions	383
Assistants' Notes	384
Photo-Mechanical Notes	385
Patent News	385
Meetings of Societies	386
Commercial and Legal Intelligence	387
Correspondence—	
Photo Button Plates and Accessories	387
Answers to Correspondents	388

SUMMARY.

This week's instalment of "Stereoscopic Photography" deals mainly with giant vision work from widely separate points, as in astronomical and mountain work. (P. 378.)

Although the thermometer now stands in the fifties, the note on fog due to high temperatures will enable our readers to cope with the trouble in the near future. (P. 377.)

The second part of Mr. J. I. Crabtree's paper on the making-up of solutions is devoted to the manipulative details, such as filtering, dissolving, and concentration. (P. 379.)

The production of imitation wood grain on metal for decorative purposes, the inadvisability of trying to patch up an unsatisfactory job, and the working-up of originals for reproduction are the subjects of "Photo-Mechanical Notes." (P. 385.)

The lay-out and fittings of a typical dark room of small dimensions is the subject dealt with by "Practicus" on page 382.

Under "Patent News" will be found abridged specifications relating to colour cinematography and the preservative packing of roll and flat films. (P. 386.)

Some useful hints in regard to weighing, filtering, and plate-coating, given at the Croydon Camera Club last week, are reported on page 386.

The effect of temperament upon a man's chances of advancement is discussed in "Assistants' Notes" on page 384.

A letter from a correspondent on page 387 gives an idea of the difficulties with which photo-button workers and ferrotype workers generally have to contend with just now.

Flattening cards, precipitating residues, masks for white-margin printing, tank development, and focal-plane cameras are among the subjects dealt with in "Answers to Correspondents." (P. 388.)

"Colour Photography" Supplement.

It is well known that the colour rendering in Autochromes is greatly affected by the nature of the illuminant used, when this is other than daylight. Some practical information on surmounting this difficulty is given on page 25.

The current instalment of "Deceonia Practica" is devoted to simplified processes of colour photography by prismatic dispersion, and includes the methods of Raymond, Poirée, and J. and E. Rheinberg. (P. 27.)

It will be interesting to many to learn that a bleach-out photograph of the spectrum made eleven years ago is still in its pristine condition. (P. 28.)

In colour cinematograph projection, when alternate red and green positives are used, there is a sort of shock to the eye caused by their rapid succession. To overcome this, it is proposed to alter the sequence. (P. 26.)

EX CATHEDRA.

A Dry Mounting Hint. There are many people who are waiting for the price of apparatus to fall to a little nearer the pre-war level who are desirous of dry-mounting a few prints occasionally, but who cannot afford the cost of a press. In these circumstances it is usual to do one's best with an ordinary laundry iron. Often the attempt is unsuccessful, and this may be due to one or more of several causes, of which one is unsuitable tissue. During the war some of this tissue was difficult enough to use even with a heavy press and suitable mounts, as it required a high temperature and great pressure. This quality would be clearly unsuited to the flat-iron method, which requires an easily melted tissue. Another mistake is to use too light an iron; if it can be obtained, a heavy laundry iron or a tailor's goose should be used instead of the small thing found in an ordinary house. When ironing the print on to the mount the iron should be pressed firmly first on one part of the print and then on another, a smoothing action as in ironing a collar is useless, as directly the iron is moved away the print springs up. A piece of very thin hard paper should be placed on the face of the print, for if the iron comes in contact with it, shiny patches are likely to appear. Strips of tissue are excellent for "tipping" prints on to mounts, as they do not cause any cockling or unevenness of the surface at the corners, which frequently occurs when paste is used.

* * *

Temperature and Chemical Fog. It should not be forgotten that, besides the fog which is caused by diffused light in any form falling upon plates and papers, chemical fog which is caused by the action of the developer upon unexposed silver bromide has sometimes to be reckoned with. Most of us are familiar with that form of it which arises from adding an undue quantity of alkali to a pyro developer in the vain hope of "forcing" out detail upon an under-exposed plate, but we often forget the fact that a high temperature has exactly the same effect as a large dose of alkali, which is to hasten development and so to arrive quickly at the point at which the unexposed haloid salts begin to be reduced. There are several ways of meeting this hot-weather trouble. A simple one is to reduce the quantity of alkali in the developer. One well-known formula calls for eight ounces of soda carbonate to each ounce of pyro. In very warm weather this can be reduced to one-half with advantage, and a further control may be obtained by the addition of a little bromide solution. Even with the amidol developer there is in the same circumstances a tendency to produce chemical fog, but the deposit is of a yellowish colour, readily recognised by anyone who has tried to develop out a much under-exposed print, with the difference that in hot weather the stain rapidly appears. Here, again, bromide is more or

less a cure, but the real remedy, or perhaps more correctly, preventive, is to reduce the temperature of developer by the addition of a little ice, or, better still, by putting the developer in an ice-box or refrigerator. A simple contrivance to serve this purpose is a wooden pail with a lump of ice in the bottom and a stand for the bottles above, a pad of several thicknesses of wet blanket serving as a lid. When raising or lowering the temperature of solutions, it is very desirable to use a thermometer, so that a moderate temperature can be obtained. With developers containing hydroquinone temperature is an important factor, and a drop below 50° Fahr. seriously affects their action. A simple but practical way of partly meeting hot weather troubles is to develop either very early in the morning or late at night. This is healthy for the operator as well as for his work, as less time is spent in the dark-room during the heat of the day.

STEREOSCOPIC PHOTOGRAPHY.

IV.—"Giant Vision."

We have spoken, in a previous article of this series, of lenses at a separation distance equivalent to that of the eyes, and for ordinary stereoscopic effects this is obviously the proper arrangement. For certain special effects, however, a very much wider separation of the lenses is admissible and even requisite.

In a paper devoted to scientific queries and replies there appeared a few years ago a question as to stereograms of the moon and how they are taken. In the following issue some one whose little learning was a dangerous thing seriously suggested the use of a twin-lens camera, and gave an instructive account of the principles of stereoscopic photography! It was almost as bad as the idea of parallax displayed by the cockney when Halley's comet was visible. "Come over this side of the street, Bill; you catch it edgeways." For a stereogram of the moon, 240,000 miles away, it need hardly be said a difference of 3 inches in the two view-points would not suffice. It is only by taking advantage of the moon's librations that we are able to get views which differ sufficiently to give stereoscopic effect. The Chicago University series of astronomical photographs includes, besides lunar stereograms, stereograms of comets taken by successive photographs of a comet at appropriate intervals of time, giving thus the equivalent of views of the comet from two widely separated standpoints. In the case of stereograms of the stars, such as the beautiful series prepared and published by the late Mr. T. E. Heath, of Tenby, the imaginary view-points had to be separated by 100 light-years instead of 3 inches. A light-year means the enormous distance traversed by light in a year when journeying at the rate of some 180,000 miles a second. These star stereograms give us, in fact, the view that a celestial giant with eyes 100 light-years apart would have of the principal constellations in our universe. Such stereograms are, of course, hand-drawn, and the positions are arrived at mathematically, but the giant-vision principle on which they are based is identical with that of the giant-vision stereograms produced with the camera.

It is obvious that a difference in view-points of three inches, while it may make an appreciable variation in the images of near objects, can have no perceptible effect on the images of distant things. The trees and houses near the horizon in an ordinary stereogram must be to all intents and purposes identical in configuration in the two halves of the stereogram, yet so marvellously sensitive is the eye that differences quite immeasurable do as a matter of fact suffice to give stereoscopic effect, and beyond that point the effect is presumably produced by the context of the picture—i.e., the relief of contiguous parts and the strong relief of the foreground.

But if we desire to produce really marked stereoscopic effect as regards distant objects we must have recourse to the plan of taking two views similar in size from two widely separated points. The effect when two such images are placed at our 2½-inch distance and combined with the aid of the stereoscope is that of a small model of the scene, in fact it is just such a view as we might suppose a Brobdingnagian giant would have of our Lilliputian landscape. Hence they may be appropriately called giant-vision stereograms.

What is required for these is some elevated plateau, enabling us to take widely separated views of a distant object—say a village, a town, or a mountain without any intervening foreground. The effect is quite a revelation. It is almost as if a telescope had been applied. There is no enlargement—rather the reverse—and yet every undulation of the ground is so vividly shown that our vision is decidedly enhanced as if by telescopic aid. The same thing may be said of the lunar stereograms which show the markings on the moon so expressively that they seem

Bruges from the Belfry—an example of giant-vision stereoscopy. By C. E. B.

to add extra telescopic power to that of the telescope used to produce them.

A single camera is, of course, all that is required for these giant-vision stereograms, which must be taken successively. The subject must be one in which no change in the scene is likely to occur between the two exposures. Crowds or moving objects must not enter into the view. A day must be selected, moreover, in which the lighting is steady and uniform. The view from Bruges belfry, reproduced herewith, was from standpoints not more than 12 feet apart. In mountain countries a plateau of table land often affords an excellent opportunity for securing a good giant-vision stereogram of a fairly distant peak or a glacier. At Murren in Switzerland there is an ideal terrace of this kind, facing the famous range of peaks so well known to the tourist.

Clouds may be taken, or indeed any moving objects, if two cameras are used and simultaneous exposure by two photographers is arranged for by signal. For clouds, several hundred yards' interval should be allowed. There are days on which very fair cloud stereograms can be produced without changing the camera's position at all, but simply allowing the cloud to change its position instead. One photograph is taken, and then you literally "wait till the cloud rolls by" and take another. Such effects can be obtained only when cumulus clouds well defined and of fairly persistent shape are drifting across the sky. A colour screen should, of course, be placed before the lens as usual in cloud photography.

The giant-vision stereogram was of great service during the war. So sensitive is the eye to any lack of due correspondence anywhere in the two halves of a stereogram that such a defect shows itself at once, the unmatched speck starting out far away from the plane of the picture. For this reason when two photographs had been taken on successive days of the enemy's position from an aeroplane the minutest change could be instantly detected by combining the pictures stereoscopically. Camouflage tricks were also exposed by the giant-vision stereogram, which made short work of the pretended haystack when its lack of cubic form was revealed in the stereoscope.

In astronomy the tedious comparison of star charts is got over very helpfully by stereoscopic combinations of charts taken at intervals of many years. Any alterations of position of celestial bodies, any new stars, or any stellar disappearances are promptly revealed. No doubt the stereoscope might be used effectually (if such a use has not already been applied) to detect any possible alterations of the lunar surface by combining in the stereoscope the oldest existing lunar photographs with the latest, taken under similar conditions of solar illumination on the moon's surface. The solar corona at the time of an eclipse is a very important subject for stereoscopic treatment. A few years ago a special opportunity occurred, and the view-points of Egypt and Alaska were to have been utilised for the two photographs. Unfortunately the Alaskan sky was clouded, so that the project was not accomplished.

C. E. B.

HOW TO PREPARE PHOTOGRAPHIC SOLUTIONS.

[In the following paper, a previous instalment of which has already appeared, Mr. J. I. Crabtree of the Eastman Research Laboratory, deals in a most explicit and comprehensive way with the practical methods of making up photographic solutions in bulk and with the chemical proportions which require to be taken in accordance with the properties of the substances which are being handled. Although contributed for the information of cinematograph photographers to the "Motion Picture News" there is scarcely a single paragraph of it which does not apply to the customary operations of any photographer working upon a reasonably large scale; and there is, we think, no photographer so fully expert in the compounding of such solutions as developers, fixing baths, etc., who will not get some practical hints from it.—Eds. "B.J."]

(*Continued from page* 368.)

Filtering

The purpose of filtering is to remove suspended matter such as dirt, caused by the presence of dust in the chemicals used, and also any residue or undissolved particles which might settle on the plates, film or paper during development. There are several methods of removing such particles as follows:

1. Allow the solution to stand and draw off or decant the clear supernatant liquid. This method is particularly useful when the suspended matter is so fine that it will pass through a coarse filter.

Since coarse particles settle quickly the rate of settling of a semi-colloidal sludge can usually be hastened by mixing the solution in hot water, because the heat tends to coagulate the suspension and causes the particles to cluster together. Thus if crystals of sodium sulphide which are brown due to the presence of iron are dissolved in hot water the colloidal iron sulphide coagulates and settles out rapidly leaving a perfectly colourless solution.

2. Filter the solution through fabric or filter paper. Filtering through paper is usually a slow process, and the continual dropping of the solution exposes it to the air, thus causing oxidation. It is usually sufficient to filter through very fine cloth or muslin which has been washed thoroughly, otherwise the sizing matter in the fabric will be washed into the solution and settle out as a sludge.

3. As a modification of method 2, when mixing a quantity of solution in a tank, stretch a filter bag made of cloth over the tank, place the chemicals in the bag (about 6 inches deep) and allow hot water to flow into it. In this way the chemicals are dissolved, and the solution filtered at the same time. A separate

Fig. 1.

bag should be used for each solution so as to eliminate all risk of contamination.

The method of supporting the bag is shown in Fig. 1, the bag being stretched over a wooden frame, and held in place by means of four iron bars passing through loops along the edges of the bag. For mixing hypo, such a bag is indispensable.

In the case of deep tanks such as are used for developing roll film, and for motion picture work, the wooden frame can be dispensed with by adopting the arrangement shown in Fig. 2. The cloth bag about 6 inches deep is supported by means of iron bars passing through seams along opposite edges of the bag, and in turn the bars are held in place either by means

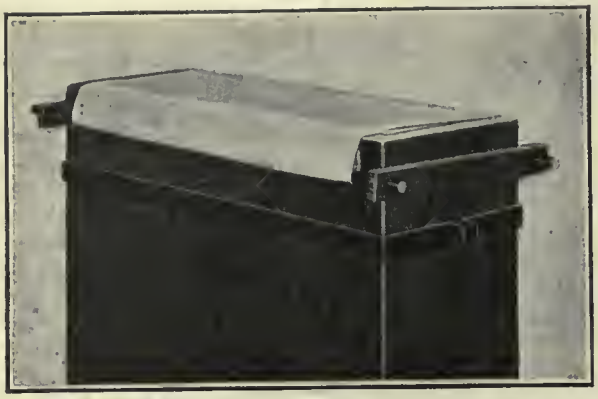


Fig. 2.

of two pieces of wood passing over the ends of the bars as shown or by metal stirrups fitted to the sides of the tank.

It is important that the bag used should be shallow (6-9 inches deep), otherwise it will dip into the solution, and the chemicals will dissolve very slowly.

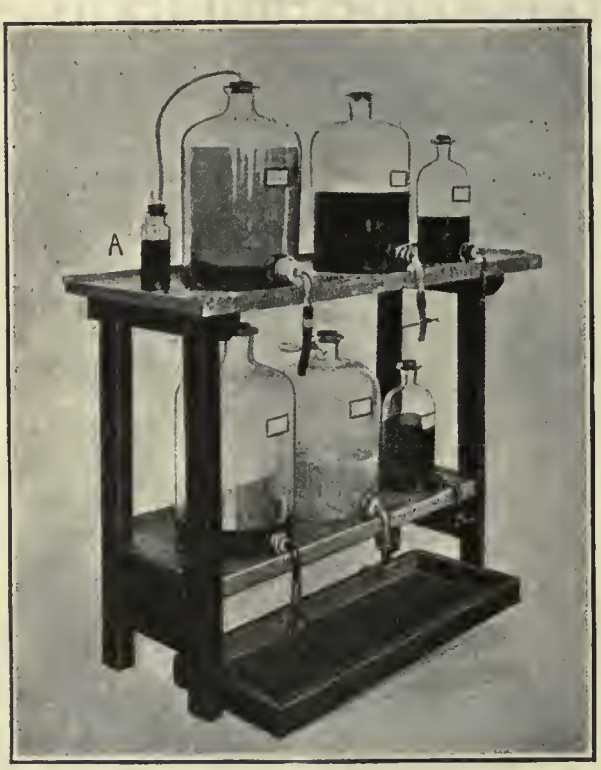


Fig. 3.

4. A combination of methods 1 and 3 is the best and most desirable as follows:

(a) For quantities of solution up to 5 gallons, filter through cloth into a bottle or crock fitted with a side tube and pinch cock. In this way the fine particles settle out, but the drainage tube is sufficiently high so as not to disturb the sediment. (See Fig. 3).

(b) For motion picture work the best arrangement for mixing is to place the chemical room immediately above the developing room, and to mix the solutions in large wooden vats or enamelled tanks connected with lead piping to the developing and fixing tanks in the dark room underneath. The solutions can then be mixed in advance, allowed to settle and tested, so that only perfect solutions pass into the tanks located in the dark room.

Removing Scum.

When mixing a chemical solution, if method 4 above is not adopted, and especially if the solutions are not filtered, a scum usually rises to the surface consisting of fibres, dust, etc., which should be skimmed off with a towel.

When a fixing bath has been used for some time, and is allowed to stand undisturbed for a few days, any sulphuretted hydrogen gas which may be present in the atmosphere forms a metallic-looking scum of silver sulphide at the surface of the liquid, and on immersing the film this scum attaches itself to the gelatine, and prevents the action of the developer. Any such scum should be carefully removed before use with a sheet of blotting paper.

Measuring Temperatures.

Temperatures of solutions are measured either by the centigrade or Fahrenheit thermometer. On the centigrade scale water freezes at zero degrees and boils at 100°, and on the Fahrenheit scale the corresponding readings are 32° and 212°, so that 100° C. are equivalent to 212° − 32° = 180° F. or 1° C. is equivalent to 9/5° F.

To convert degrees Centigrade to Fahrenheit, multiply by 9/5 and add 32. To convert degrees Fahrenheit to Centigrade subtract 32 and divide by 9/5.

In photography the Fahrenheit thermometer is almost universally employed. There would be no appreciable advantage in adopting the Centigrade scale, while the precision of the Fahrenheit scale is greater since an error of 1° in reading the Centigrade scale means an error of practically 2° on the Fahrenheit scale.

How to Mix Developing Solutions

A developer usually contains four solid ingredients as follows:

A. The developing agent (Elon, hydroquinone, pyro, paraminophenol, etc.)

B. The alkali (carbonates and hydroxides of lithium, sodium, potassium and ammonium).

C. The preservative (sulphites, bisulphites, and metabisulphites of sodium and potassium).

D. The restrainer (bromides and iodides of sodium, potassium and ammonium).

If a developing agent like hydroquinone is dissolved in water, the solution will either not develop at all or only very slowly, and on standing it will gradually turn brown due to what is known as oxidation or chemical combination of the hydroquinone with the oxygen present in the air in contact with the surface of the liquid. This oxidation product is of the nature of a dye and will stain fabrics or gelatine just like a dye solution.

On adding a solution of an alkali such as sodium carbonate, the hydroquinone at once becomes a developer, but at the same time the rate of oxidation is increased to such an extent that the solution very rapidly turns dark brown, and if a plate is developed in this solution it becomes stained and fogged. The subject of "Chemical Fog" has been fully treated by the author in a separate article (Amer. Ann. Phot., 1919) to which the reader is referred.

If we add a little sodium bisulphite to the brown-coloured solution mentioned above, the brown colour or stain is bleached out and a colourless solution is obtained. Therefore, if the preservative is first added to the developer, on adding the accelerator the solution remains perfectly clear, because the sulphite

preserves or protects the developing agent from oxidation by the air.

As a rule the preservative should be dissolved first.

An apparent exception to this rule should be made when dissolving Elon in concentrated solution, since this developing substance is insoluble in a strong solution of sodium sulphite, while if a sulphite solution is added to a strong solution of the developing agent a white precipitate is formed.* When once the Elon is dissolved, however, it takes a fairly high concentration of sulphite to bring it out of solution again, though only a low concentration is required to prevent the Elon from dissolving.

On this account some direction-sheets recommend that the Elon should be dissolved first, though if water containing dissolved air is used the Elon will oxidise, and only a small amount of oxidation product is necessary to cause chemical fog. Therefore, when dissolving Elon, dissolve a portion of the sulphite first, sufficient to prevent the immediate oxidation, and yet not enough to prevent the Elon from dissolving readily, then dissolve the Elon, and finally add the remainder of the sulphite.

The alkali (say carbonate) may then be added:

(a) Dissolve the carbonate separately and add to the cooled Elon-sulphite solution. There is danger, however, of the Elon precipitating out before the carbonate is added.

(b) After dissolving a portion of the sulphite and adding the Elon, dissolve the remainder of the sulphite and carbonate together, cool, and add to the Elon-sulphite mixture.

The above procedure is necessary so that when the carbonate is added the solutions are cool. If a hot carbonate solution is added to the developing agent, even in the presence of the preservative, some substance is formed which produces chemical fog.

In the case of developers containing no bromide, used for testing the quality of plates, and for developing under-exposed negatives, it is absolutely necessary to mix the developer with cold water if a minimum of fog is desired.

In the case of some samples of paraminophenol which are discoloured by the presence of oxidation products, these may be partially removed by boiling after adding to the sulphite solution. In this way the oxidation products are reduced back again by the sulphite to paraminophenol, though the solution should be cooled again before adding the carbonate. If pure chemicals are used such a procedure is, of course, entirely unnecessary.

Bromides and iodides are added to a developer to compensate for any chemical fog produced by the developer, or inherent in the emulsion. It is immaterial at what stage the bromide is added during mixing.

When mixing a developer the following rules should therefore be followed:

1. *Dissolve the preservative first.* In the case of Elon dissolve only a portion of the sulphite first, dissolve the Elon, and then add the remainder of the sulphite.

2. *Make sure that one chemical is dissolved before adding the next.* If the alkali is added before the crystals of the developing agent are dissolved, each crystal becomes oxidised at the surface and the resulting solution will give fog.

3. *Mix the developer at as low a temperature as possible.*

4. In the case of desiccated chemicals like sodium carbonate and sodium sulphite, *add the chemical to the water and not vice versa.*

(*) This consists of methyl-paraminophenol base which is relatively insoluble, but in combination with sulphuric acid (Elon) it is readily soluble. When sodium sulphite is added to Elon the acid portion is neutralised and the difficultly soluble base is precipitated. The presence of acid may be shown by adding a little sodium carbonate to Elon when effervescence takes place. The reason why Elon does not precipitate with sodium carbonate is because the Elon base combines with it forming a sodium salt which is readily soluble.

Two practical methods of mixing are possible, as follows:

(a) Dissolve all the chemicals in one bottle or vessel by adding the solid chemicals to the water in the correct order (in the formula the ingredients should be named in the order in which they are dissolved). For example, to mix the following formula proceed as follows:

Sodium sulphite	75 Gms.
Elon	10 Gms.
Hydroquinone	5 Gms.
Sodium carbonate	50 Gms.
Potassium bromide	1.5 Gms.
Water to	1 Litre.

Dissolve about ten grammes of the sulphite in about 750 c.c. of warm water, and then dissolve the Elon. Now dissolve the remainder of the sulphite, and then the hydroquinone. Finally, add the carbonate and bromide, and dilute to 1,000 c.c.

For large quantities the filter-bag method should be used, the chemicals being placed in the bag and dissolved in the above order.

(b) An alternative method is to dissolve the preservative and developing agent in one vessel, and the carbonate and bromide in another, cool and mix. This method is the safest and best for quantity production.

For example, to mix the following motion picture developer, proceed as follows:

Sodium sulphite	4 lbs.
Hydroquinone	13 ozs.
Sodium carbonate	4 lbs.
Potassium bromide	3 ozs.
Water to	10 gals.

Dissolve the sulphite in about one gallon of hot water, then dissolve the hydroquinone, and filter into the tank. Then add one gallon of cold water to the tank, dissolve the sodium carbonate and bromide in one gallon of hot water, and filter this into the tank, immediately adding cold water up to ten gallons. The object of adding cold water to the tank before adding the carbonate is to cool off the solution before the carbonate is added.

Mixing Concentrated Developers.

The extent to which a developer may be concentrated is determined by the solubility of the least soluble constituent, because a stock solution should usually withstand cooling to 40° F. without any of the ingredients crystallising out. Usually, the hydroquinone and Elon come out of solution on cooling, but by adding alcohol (grain, wood, or denatured) up to a concentration of 10 per cent., the crystallisation is prevented, since the developing agents are very soluble in alcohol.

The addition of the alcohol does not prevent the other ingredients such as sodium sulphite from crystallising out; in fact, the alcohol diminishes their solubility, and therefore increases the tendency to come out of solution.

A paraminophenol-carbonate developer is difficult to prepare in concentrated form, though by adding a little caustic soda the solubility of the paraminophenol is increased and a stronger solution can be thus prepared.

When preparing concentrated developers it is important to observe carefully the rules of mixing, taking care to keep the temperature of the solution as low as possible if a colourless developer is to be obtained.

Two Solution Developers.

A two-solution developer is simply a one-solution developer split into two parts, one containing the carbonate and bromide, the other containing the developing agent and preservatives, so that the developer will oxidise less readily, and therefore keep well. The reason why it is customary to keep a developer like pyro in two solutions is because pyro oxidises much more readily than Elon or paraminophenol with a given amount of preservative.

For purposes of mixing only one solution developers need be

considered because the same rules regarding mixing apply in both cases.

Developing Troubles.

In order to be able to explain the reason for any particular developer trouble it is necessary to understand thoroughly what takes place when the ingredients are mixed in the wrong order or if any ingredient is omitted from the formula, and also the effect of chemical impurities. It is impossible in this article to indicate every possible trouble, but the more important ones may be listed as follows:—

1. *The Developer Gives Fog or Chemical Fog.*—Fog is the chief trouble caused by faulty mixing. It may be due to any of the following reasons: Violation of the rules of mixing, mixing the solution too hot, omission of the bromide, addition of too much carbonate or too little sulphite, the use of impure chemicals, etc. (See article on Chemical Fog above.)

2. *The Solution is Coloured.*—As a general rule the developer when mixed should be colourless, and if coloured the developer should be suspected as being liable to give fog. In the case of a pyro developer mixed with bisulphite which contains iron, the iron combines with the pyro to form an inky substance which imparts a dirty red colour to the solution.

If a pyro developer is mixed as two separate solutions A and B, the pyro B solution, which usually contains only carbonate and bromide, should be perfectly colourless, though if carelessly mixed in dirty vessels it may be coloured brown by the presence of a little pyro A.

3. *If the solution does not develop*, then either the developing agent or the carbonate was omitted during mixing.

J. I. Crabtree.

(*To be continued.*)

PRACTICUS IN THE STUDIO.

[Previous articles of this series, in which the aim of the writer is to communicate items of a long experience in studio portraiture, have appeared weekly since the beginning of the present year. It is not thought possible to continue the series to the length of that by the same writer which ran through the "British Journal" some years ago, but if any reader among the younger generation of photographers, and particularly those engaged as assistants, has a particular subject which might be dealt with, his or her suggestion will be welcomed. The subjects of the previous articles of the series have been as follows:—

A Talk About Lighting (Jan. 3).
The Camera and the Lens (Jan. 10).
Managing the Sitter (Jan. 17).
Backgrounds (Jan. 24).
Studio Exposures (Jan. 31).
Artificial Lighting (Feb. 7).
Printing Processes for Portraiture (Feb. 14).
Studio Accessories and Furniture (Feb. 21).
The Surroundings of the Studio (Feb. 28).
Studio Heating and Ventilation (March 7).
The Postcard Studio (March 14).
The Printing-Room (March 21).
About the Reception Room (March 28).
Home Portraiture (April 4).
Portable Studios (April 11).
Copying (April 18).
Handling the Studio Camera (April 25).
More About Lenses (May 2).
Enlargements (May 9).
Advertising the Studio (May 16).
Mounts and Mounting (May 23).
Business Methods (May 30).
Photographing Children (June 6).
Portraits of Elderly People (June 13).
Something about Lenses (June 20).
Hand Cameras for Professionals (June 27).

THE DARK-ROOM AND ITS FITTINGS.

When we consider the amount of time which a photographer spends in his dark-room, it would be supposed that he would do his utmost to plan it so that the space at his disposal should be utilised in such a way that the work should be carried out in the most convenient manner possible, and that all unnecessary steps and movements should be avoided. But in many cases this is not done, and the room appears as if it had been fitted up by a builder without any knowledge of photography, and that he had placed the various fittings where he thought that they looked best, without reference to their use. To prove this I may instance one place fitted up only a few months ago in which the red lamp was placed immediately behind the operator, so that he was effectually prevented from seeing what he was doing when he stood at the sink.

The smaller the dark-room the more need for careful planning, and we might well take a lesson from the ship-builders, who manage to squeeze the maximum of accommodation into the minimum of space. In the first place, I would point out that in the majority of dark-rooms too much room is allowed for the operator and too little for the fittings. Let us take the case of a floor space of 6 ft. by 4, which we may consider the minimum (although I have often had to work in less), and see how we can plan it to the best advantage. If there happens to be a window in it, it should be ignored for lighting purposes, although it should be made to open easily for ventilation. This gives us a free hand for the placing of the sink. I should then arrange things in the following way. The doorway 2 ft. wide should be out in one of the 4-ft. sides, preferably on the left hand. This must be well rebated so that in case of a slight shrinkage no light will be admitted. A bench 2 ft. wide is run the whole length of the room, and in the centre of this a 36 x 22 Doulton or lead lined sink is fitted, leaving two solid pieces 18 x 24 at either end, these being covered with lead or ruberoid or well coated with asphaltum varnish. Lead is the cleanest and most durable, and should be used if the expense is not objected to. The red lamp should be placed over the left back corner of the sink and the water tap over the middle of the sink, not projecting too far forward. Across the further end of the room a plain bench 15 ins. wide is fixed between the wall and the long bench. This answers for filling-in or, if it be preferred, a printing-box may be installed here and filling-in done on that part of the bench which is just behind the door, the latter, of course, being made to open outwards. A narrow shelf for bottles and measures should be placed over the sink, and a shallow cupboard with the door hinged at the top fixed over the filling-in bench to receive exposed plates. The reserve stock of plates can be stacked on a shelf under the bench. The fixing-bath or tank is put on the bench to the left of the sink or, if preferred, on a shelf below it. I do not, however, care for this arrangement, as it is then difficult to avoid splashing hypo on the floor. A shelf or rack may be fitted over the end bench to receive spare dark-slides, inner carriers, and the like.

So much for the general plan. Now let us go into the details of the fittings.

As I do not know what illuminant will be available, it is not possible to give precise details as to the red lamp, so that it can only be dealt with in general terms. One thing is important, that it should be of adequate size. The minimum

frontage should be 10 x 8 and as much larger as convenient. This allows of a safe medium being chosen and still having a good working light. Now as to the medium: Some ruby glass is safe for use with rapid plates, but much is not, and the eye is not a safe guide. I have seen a very deep ruby which passed an appreciable amount of blue, while a lighter colour, such as that used in the old Perfection lamps, was fairly safe. For use with an oil light or carbon filament one thickness of ruby glass and one of canary fabric seems quite safe, or one thickness of orange glass and one of red fabric. The metallic filament lamps are more actinic, and if these are used it is better to use the Wratten or Lumière "safe lights," which are scientifically constructed so as to be quite secure against fogging. After all, the best way is to make a practical test with the plates it is intended to use. If a plate partly covered with a piece of metal —a penny will do—can be exposed in the position usually occupied by the developing dish for five minutes, and after development in a covered dish for the same period shows little difference between the covered and uncovered parts, the light can be considered as reasonably safe. For bromide printing a brighter light is required, and I have found that two thicknesses of canary medium bound up between glass give a safe light with any bromide paper I have used. If gas is used, the ordinary fish-tail burner is the best, as the light is yellow to begin with, but as some gas gives but little light when used in this way it may be necessary to use a small inverted mantle. With this a sheet of yellow glass may be added to the fabric. A single thickness of Perfection glass seems quite safe for bromide papers.

There is a certain amount of choice in the material of which the sink is composed; it may either be composed of wood lined with lead or an asphalt sheeting such as ruberoid, or, what I consider better, of stoneware. If the latter be chosen, it is very necessary that it should be of the hard vitrified quality which has a dirty yellow surface. This has no glaze to flake off, and will last until it is broken, which, I may say, is an unlikely contingency. There is a much nicer-looking quality which has a white glaze on the inside. This I have not found reliable, as the glaze is liable to crack, and when the chemicals begin to percolate into it the glaze comes off in flakes. Zinc or galvanised iron must not be used for sinks, as they rapidly corrode and become leaky. Slate is also a bad material, as it is likely to flake away, and, even if it does not, leaks are likely to occur at the joints. With any sink it is advisable to use a rather close wooden grid covering the whole bottom. This saves many breakages both of measures and negatives, and has the advantage of keeping the dishes out of the water which is always present, more or less, at the bottom of the sink. A trap with a screw plug should be fitted to the waste pipe, so that any obstruction can be removed without having to call in the plumber.

The question of dish versus tank development cannot be dealt with here, but a word on the materials of which dishes and tanks are composed may not be out of place. Porcelain dishes are most generally used, but they are heavy and fragile, and I strongly advise the use of a good make of enamelled iron in their stead. Even these require a certain amount of care in use, but it is surprising how many falls and knocks they will stand without chipping. Good vulcanite dishes are also very serviceable, but they are costly and not now easily procurable. Celluloid dishes are only useful for very occasional use; even the best of them are very apt to crack at the corners, and there is also a tendency for them to warp, often to an extent which renders them useless. Wooden dishes are convenient when large numbers of plates are dealt with, but it is difficult to find a coating which will resist the alkali in the developer. I used some, many years ago, of American make which stood very well, but I could never discover the composition of the varnish. Possibly gas-tar diluted with naphtha, which was recommended for the purpose by Mr. F. A. Bridge, would do, but I cannot speak from experience. I have tried shellac with an alkaline developer, and the wood was bare in a week. Tanks for developing and fixing are steadily growing in popularity. The amateur tanks made of brass or zinc are of little use to the professional who does not want to develop in daylight. Good wooden tanks with loose racks seem to answer well, and a later model, with an enamelled tank and a wooden rack, seems better still. The ordinary porcelain tanks are not suitable for development, as they require an enormous bulk of solution in proportion to the plates they hold. Such tanks are, however, useful for fixing, if one is careful not to drop the negatives in too suddenly, when either plate or tank may suffer. On the whole I prefer a stout lead-lined tank for hypo. Washing tanks are best made of plain zinc; the white japanned ones look clean, but unfortunately they are made on a base of sheet iron or steel, and once the protective coating is damaged corrosion goes on apace. One advantage of a zinc tank is that it can be cheaply repaired. I have one half-plate tank which has now its third bottom; the others have been rubbed through. The sides and grooving are strong and good after twenty-five years' wear.

A little point I had nearly forgotten is that of taps. The swing-arm tap is attractive to look at, but it quickly goes wrong, and when it becomes leaky it is difficult to repair. A good ordinary tap with an anti-splash, to which a short length of rubber tube can be attached, is the most practical arrangement. It is a good plan to have an extra tap to supply the washing tank, so that plates do not have to be rinsed over the tank. If there is only one tap the rubber tube can be lifted out of the tank for rinsing purposes.

Last, but not least, comes the question of ventilation. We must not trust to badly fitting doors and partitions for this. A proper inlet and outlet for air must be provided, or the operator's health will suffer. I have found it answer well to have a row of inch and a-half holes, well trapped, made in the partition below the sink and another similar row on the same side near the roof. With this arrangement a current of air is always passing just where the operator usually stands. Care must be taken not to block the inlet with boxes, tanks, or the like. If it be possible to fit an exhaust fan, worked by electricity or water, in the dark-room, by all means do so. It is a luxury in hot weather.

Although I have only specifically described a very small dark-room, it does not follow that such a size is a desirable one, and the larger ones, besides being more comfortable to work in, allow of more fittings, such as enlargers, being placed therein; the principle is the same: as much sink-room as you are ever likely to need and plenty of benches. Do not use the dark-room as a store for lumber. A small, clear space is better than a large one in which you have no room to turn.

PRACTICUS.

FORTHCOMING EXHIBITIONS.

September 13 to October 11.—London Salon of Photography. Entries close September 2. Hon. sec., 5a, Pall Mall East, London, S.W.1.

A FIRE broke out at 2.15 a.m. on Sunday at the premises of Mr. J. Reuben, 241, Old Kent Road, S.E., photographer. About 6 ft. by 4 ft. of flooring and joisting was damaged by fire and cutting away in the shop, whilst the contents were slightly damaged by smoke.

AERIAL PHOTOGRAPHY.—With regard to the possibilities of stereoscopic photography in charting unsurveyed country, Mr. Holt Thomas, at the London Society last week, said that a single aeroplane had in one flight completely covered with photographs an area of 40 square miles. The cameras used for this work were quite automatic, and once started would go on taking photographs of whatever was under them, without any attention until the film was used up.

Assistants' Notes.

Notes by assistants suitable for this column will be considered and paid for on the first of the month following publication.

The Man and the Job.

Among my photographic acquaintances are two who, for the time being, I will call Smith and Jones, for the simple reason that those are not their names, or anything like them.

Smith and Jones are living examples of how and how not to treat one's employment.

Jones is a pessimist; he reckons photography in general, and his own job in particular, as decidedly "N.G." He is always on the move, and his moves are vague and indefinite. This is because Jones has no forethought; his moves are usually precipitated by that fed-up feeling, and his moving places found by an orgy of letter writing in reply to advertisements.

This necessitates a preliminary and frantic search for the current "B.J."—I know, because he's borrowed mine at times—for Jones is a chap who has no time for reading (and if he had he'd probably pooh-pooh everything he read).

Smith is also a wanderer—or used to be—but of a different sort. Smith moved about because it pleased him to, and he moved just when and where he liked. The consequence was, he acquired a broad experience and saw some life, believing in that old proverb, "A rolling stone gathers polish rather than fungi."

Now, how did Smith manage to move when and where he liked? It was due to a combination of circumstances, which I will try to explain. In the first case, he was a very observant person. He studied his trade journal, and so was always up to date, and always knew the state of the labour market. I remember him saying once that his best appointments had been obtained when he least needed them, which means that if he hadn't sought them until they were needed he wouldn't have got them.

When Smith arrived in a new town, the people in the place he went to work for were not the only ones who knew it. Quietly and without ostentation he would introduce himself to every photographer in the place. "Nothing like being known," he would say, and certainly his sociability was at times of advantage—to others as well as himself. He could inform one on so many studios and workshops that it was odds on that any vacant post could be correctly gauged by applying to Smith.

Although he left so many jobs, he reckoned to have always exhausted a position's possibilities before turning it down. This is where many workers fail. They contemplate a move without first asking, "Am I better off for the future where I am?" If not, that is when the place is absolutely worked out as far as improvement goes; then it is time to move, but not before—unless for something extra good. While a post has monetary or educational value it is worth making the most of.

The Smiths of photography never leave such jobs without precise deliberation. How do they keep them and always manage to go up when they leave?

Geniality and business instinct have a lot to do with it; skill and reputation go a long way, too; they should all be cultivated. The genial man—not too genial, by the way—has a big hold on his boss and his fellow workers; he will be considered when the grouser is forgotten or wished away. The pleasant chap, coming like a sea breeze or a ray of summer sun into a strange studio, will obtain a vacant post where a pessimist would not.

Business instinct will save the genial employee from being swindled, put upon, or made a "willing horse." When "up against" anything, the unbusinesslike worker may use "language" or may walk out quietly; the businesslike one will firmly point out his side of the case and politely insist on his rights. Ten to one he wins every time.

A great deal of Smith's success was due, I think, to his skill and the way he used it (sounds ambiguous, but I will explain). He acquired, by hard work and study, almost specialist skill in a good many distinct lines. When he wanted a change he was not tied down to a chance in any one branch. If no operators were wanted, well, perhaps retouchers or enlargers were in demand, and so he always had multiple chances. But he never went as a G.K.C., as he would term the all-round man. Now, Jones was a typical G.K.C. (general knockabout comedian), with a smattering of all branches of photography but without the ability to get the wages of a good exponent of any one line. If Smith was engaged as an operator, he kept within his agreement and studiously avoided the printing department. If asked to undertake more than one job, he was agreeable only if the matter was on a business footing and the pay adequate.

Although Smith left a few employers much against their wishes, he managed to save his reputation. He could always mention a firm who would willingly recommend him for some particular work, and if asked he could always show a good reference and specimen in keeping with a new shop's requirements.

Personally, I don't believe in carrying references or specimens. The former are often "tommy rot," and the latter are "acquirable." I travelled long and far without ever showing one or the other.

Reputation, though, is a serious factor, and whether we carry evidence or not, the facts can be rooted out. Therefore, one must have a good reputation. If through misfortune things are otherwise—a worker's reputation goes when he is known to have been in a cheap or shady firm, even though his character be irreproachable—then one must do without a reputation altogether until a new one can be built. A knowledge of the world photographic will simplify this.

The wise employee will never leave a nasty taste behind him. I know it's nice to tell a man a few coloured facts now and then—I've done it—but in after years that man may have something of benefit for us, and the coloured facts may rise and bar the way.

Every employer a workman knows should be looked on as a link in the workman's connection, just as the owner looks on his sitters. Every link is useful, and should receive intelligent consideration. The fact of not being able to work for a certain man does not mean that that man is no use.

A few hints in conclusion: When writing to a stranger be polite, businesslike, and concise, but not curt or snappy. In studying his reply, don't overlook the style, phraseology, and writing. They tell quite a lot, as a rule. Place your inquiries deliberately, not at random. For instance, if you want an operator's post in, say, Birmingham, advertise the fact. Also watch the "B.J." Plenty of adverts. appear for Birmingham, but they don't pop up to order at the critical last moment. The Birmingham daily papers—taken by all city libraries—are also worth watching. If you know any photographers in the district inquire of them.

A craftsman who has a particular penchant for any make of paper or plates should get to know the representative of the commodity. Many a master and man have been united by the kindly—though, of course, unofficial—offices of the "man of the road."

It sometimes happens that an excellent opening occurs in a line that one has no practical experience of. To take it or not is a difficult thing to decide, and must depend on the man himself. I remember, when war broke out, being asked to undertake some very important work, the nature of which—though photographic—was totally foreign to me. I decided to chance it, and succeeded by sheer bluff, until I had gained sufficient working knowledge to carry on. I never regretted my decision, but must admit it was sailing close to the wind. Had I been found incompetent it would have meant disaster so far as that work and my reputation were concerned. Much assistance was gained in this case from the "B.J." and a couple of handbooks. For the observant craftsman, however, there are always openings without undue risk, and the cheerful, confident individual need fear nothing worse than a fall on his feet if he only keeps up-to-date and wide awake.

Granted that wages and general conditions are as yet unstandardised and unsatisfactory, it is still possible to keep going toward better times.—Thermit.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

SATURDAY, JULY 5.

Manchester Amateur Photographic Society. Outing to Wilmslow.

MONDAY, JULY 7.

South London Photographic Society. Print Criticism Evening.

TUESDAY, JULY 8.

Manchester Amateur Photographic Society.—Monthly Meeting.

Hackney Photographic Society "Northern Europe." Dr. C. Aikin Swan.

THURSDAY, JULY 10.

Rodley and District Photographic Society. Monthly competition: "Summer Rambles."

Hampshire House Photographic Society. "Toning." G. Hawkings.

CROYDON CAMERA CLUB.

LAST week Mr. T. W. Purkis was down for an evening on "Stupendous Stunts," a title not his own. Prior to starting the stunts, votes of thanks were accorded all who had helped to make the Affiliation outing a success, with special reference to the secretary, Mr. J. M. Sellors, who had worked like a horse. The president, Mr. J. Keane, in an outburst of oratory, referred to the secretary's achievements as of "outstanding and staggering significance."

Of the many capital stunts executed by Mr. Purkis, reference can only be made to a few having some connection with photography. The first shown was a neat way of weighing small quantities of chemicals without contaminating them by contact with a possibly dirty pan. The little corrugated papers used for chocolates were employed, one for receiving the chemicals to be weighed, the other as a counter-weight. They are sold at 1s. 6d. a thousand (No. 3 size), and may be procured from Kettles, of New Oxford Street.

The next tip was a method of simultaneously dissolving and filtering chemicals not readily soluble. A large glass funnel is placed with its tube in a bottle of sufficient size, and a pledget of cotton-wool is rammed down into the funnel, so that water placed in it only emerges drop by drop, the rate being regulated by the degree the wool is compressed. This can be ascertained by adding water before starting, which is thrown away after the test. The chemical to be dissolved is placed on the cotton-wool and the requisite quantity of water carefully poured into the funnel, whereupon a short holiday can be taken, with every assurance that solution is proceeding satisfactorily in one's absence. A fair quantity of the cotton-wool seemed to have drifted into the president's brain box judging from the questions he asked, but the idea ultimately filtered through in pristine clarity.

A really capital levelling-slab followed. It is made by taking a sheet of thick plate-glass and attaching at each corner a leg of "plasticine" about one inch high. With a spirit-level placed on top, the glass is pressed down in directions indicated by the bubble, until a perfectly level surface is obtained. If the table is to be used for heavy things, considerable pressure must be given; for light things less pressure, naturally, suffices.

During the war the lecturer had occasion to coat very small discs with collodion emulsion, and found the table most useful as a setting slab. When coating, he dispenses with any form of pneumatic holder, which often records its form in the emulsion, probably due to the circular strain induced in the glass. Instead he uses some hectograph jelly, on top of a rod of glass, for very small discs. For coating glasses of large size up to 10 x 8, he attaches with seccotine a quarter-plate glass to a wooden holder, and then applies small pieces of the sheet jelly to the four uppermost corners, which in turn hold the large plate. The correct formula for the jelly aroused fierce controversy, and at one time it appeared inevitable that blood would be shed. With all reservation we give the lecturer's recipe:—Soft gelatine (Nelson's No. 1, O.K., but expensive), 1 oz.; treacle (if you ask for treacle you will get golden syrup, which is right), 8 fl. ozs.; water, 5 ozs.; 10 per cent. carbolic in alcohol, 1 fl. dr. Proceed as usual (no directions for mixing were given).

The next exhibited a whirler improvised out of an egg-whisk, introducing anxiety in his neighbours when he coated a held glass with fish-glue solution. Excess was, however, whirled off by placing the glass, coated side down, in a large tin, and nobody suffered. A simple and novel spectroscope now shown was based on the principle of cadging a piece of discarded Thorpe replica grating, but as Mr. Thorpe has been unkind enough not to answer the last letter of request, a detailed description seems unnecessary. The instrument rattled horribly when moved, but this did not impair its efficiency, a fine spectrum of the first disorder being secured. Finally, Mr. Purkis drew attention to a small soldering iron fitted with an automatic blowpipe, which, in his hands, kept the iron at a cherry-red heat. A most hearty vote of thanks was accorded the "stupendous stunter" with great acclamation.

Photo-Mechanical Notes.

The Imitation of Wood on Metal.

A GOOD deal of metal furniture is now being sold which resembles wood—for example, desks, filing cabinets, cash registers, etc. In some cases this is painted by hand, the graining being done in the way made familiar by the house painter. Needless to say, this is not particularly faithful, and the first improvement consisted in taking a selected plank showing a fine specimen of grain, cleaning it thoroughly, covering it with a suitable ink, squeegeeing off the excess, which leaves the compound only in the grain, then rolling over this with a composition roller of a circumference large enough to cover the metal sheet to be grained, then off-setting from the composition roller to the metal plate, baking, varnishing, and the graining is finished. This method depends on the fact that the grain is produced by differences of surface, but it does not give you any of the effect light may have on the grain independent of surface. For instance, in an oak, the big, flat grain will always appear white by this method, whereas in really good wood, if looked at in a certain way, these white patches of grain have a dark centre, which is not due to any differences of level of surface, but to the play of light. Now, all these delicate differences can be reproduced by photography, using, of course, suitable lighting, proper colour-filters, and a panchromatic plate. A half-tone negative is made, and from this a print on metal, which can be transferred by means of the composition roller; or the plate may be etched if any improvement is required to be done by fine etching before the transfer is made. But perhaps the best effect of all can be obtained if a half-tone positive is made and from it a lightly etched intaglio plate, which is inked up, and the transfer taken from it.

Do not Tinker with your Engravings.

THE chief source of error in making engravings is incorrect instructions, or correct but insufficient instructions which leave room for misunderstanding. The fault lies here with the office, who if the instructions given by the customer are vague, should get them definitely before passing the work out to the shop. On the other hand, the shop foreman should ask the office for definite instructions if they are not given. But when a mistake has been made, to whatever it was due, it will generally be found cheaper and more satisfactory, to find out the point where the mistake occurred and commence over again from there rather than tinker with the work in an endeavour to rectify the error on the finished job. If there is one thing more than another that has retarded the progress of three-colour work it is the possibility of asking the fine-etcher and engraver to rectify all the faults in the process. Had it not been for this we should long ago have had three-colour results just as possible mechanically as are black-and-white results, for we should have been forced to use correct filters and plates, to give correct exposures, and to insist on truly complementary inks. But anything does now, because, however gross the error, it can be patched up by the re-etcher, expensive and more or less unsatisfactory as the system. What is so plainly true of three-colour is also true of ordinary half-tone, and even line work. It usually costs more to patch up mistakes than it costs to start the work over at the point where the error crept in, and is less satisfactory in the end.

Retouched Originals in Half-Tone Work.

A freshly retouched original that is well done is a delight to the operator to handle. But the retouching is not always well done from the point of view of the photographer, and one of the most difficult lessons for the retoucher to learn is to know how the colours he uses are going to photograph. Generally speaking, it is quite unsafe to use any other colour than one that matches the photograph that is being retouched; for example, it is a mistake to use a brown on a black and white print. Retouching is expensive work, and the customer is apt to put a limit on the money he is willing to spend, and therefore the retoucher cannot do exactly as he would like; but he should be careful that if he touches certain tones in the photograph he should touch all of them, as otherwise the retouching is very likely to reproduce differently from the photographic image itself, with unfortunate results. This is particularly true of the deep shadows. The retoucher will sometimes strengthen up some shadows and assume that others on the print are strong enough, but in the reproduction the one may come out black and the other grey, and so upset the whole value of the picture. However good the retouching, it usually deteriorates with age, so that if any old originals are to be re-photographed they should be carefully looked over first. The photograph itself is likely to have faded, and so makes the contrast with the retouching entirely wrong. Any Chinese white on the print will probably have become yellowed, and some of the blacks, particularly if the paint has been mixed with gum, will probably have chipped off. Some insects appear to have a peculiar fondness for the pigments used by retouchers, and if the originals have been stored where these pests are they will be found to require considerable attention before they can be re-photographed.

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Applications, June 16 to 21.

CINEMATOGRAPHY.—No. 15,259. Cinematograph screen. T. Cooper and A. Slater.

CINEMATOGRAPHY.—No. 15,088. Winding apparatus for cinematograph picture films. H. Dixon, F. C. Jessett.

CINEMATOGRAPHY.—No. 15,252. Cinematographs. G. Lynch.

CINEMATOGRAPHY.—No. 15,547 and No. 15,548. Cinematograph screens. W. J. Marks.

COLOUR CINEMATOGRAPHY.—No. 15,549. Method of adding colour to cinematograph pictures. W. J. Marks.

CINEMATOGRAPHY.—No. 15,550. Mobile cinematograph outfits. W. J. Marks.

PHOTOGRAPH FRAMES.—No. 15,142. Photograph frames. W. P. Winsor.

COMPLETE SPECIFICATIONS ACCEPTED,

These specifications are obtainable, price 6d. each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

COLOUR CINEMATOGRAPHY.—No. 126,220 (August 14, 1918). The invention relates to a system of colour cinematography in which six successive different colour selections are made. Three of these are red colour-sensations, and are alternately arranged; of the other three, one is green and the remaining two are primary colour selections other than red. In consequence of the length of the specification, the details of the process are transferred to the Colour Photography Supplement published with this issue. Joseph Shaw, 8, South Second Avenue, Mount Vernon, New York.

WATERPROOFING FILM SPOOLS AND PACKS.—No. 116,882. May 12, 1919. The aim of this invention is to produce a self-contained cartridge, pack, or other multi-exposure film package, which without a separate container shall be hermetically sealed, waterproof, and capable of withstanding for long periods even immersion in water, thereby greatly prolonging the period within which the film may be satisfactorily exposed and developed, and guarding the same against injury by mishaps before or after exposure, which under present conditions would utterly destroy their usefulness.

The stated ends can be attained by first hermetically sealing all openings through which moisture might possibly enter within the photographic cartridge, pack, or package, and thereafter immersing the whole in a bath of waterproofing material, or otherwise completely coating its exterior with such material.

Under the construction now generally adopted, the end of the outer wrapper or envelope is V-pointed, and held down upon the body of the cartridge by a sticker or paster, which is carried around the cartridge either completely or partially. Under the new construction, this pointed end is folded back within the wrapper, and instead of a paster or sticker covering the meeting line of the free end and the body of the wrapper or envelope for a portion only of its length, a waterproof strip or band of or coated with adhesive materials is employed, which extends from end to end of the fold or joint, and hermetically seals the opening between the free end and body portion of the wrapper or envelope. At each end of the cartridge is applied a strip or band of like adhesive waterproof material, pressing the same down into firm and close contact with the outer and inner faces of the discs, and causing the inner edges of the strips to overlap and adhere to the sealing strip or band and to the wrapper or envelope, if the same be not completely encircled by said sealing strip or band.

As the discs are somewhat lightly pressed to place upon the shouldered ends of the spool, there is a possibility of moisture entering at these points. Effectively to guard against this, the entire exposed or outer surface of the cartridge, pack, or package is coated with a waterproofing agent in the form of a liquid solution, either by brief immersion therein or by applying the same by brush, spray, or otherwise. Cellulose acetate, cellulose nitrate, or like cellulose derivative is admirably suited to this purpose, these being capable of being made as thick or thin as desired, and being also thoroughly waterproof.

In its essential features the mode of waterproofing the film pack is the same as in the case of the cartridge; that is to say, the openings of the light-excluding wrapper or envelope are first sealed by strips of adhesive, waterproof tissue of fabric. Thus strips are applied to and made to overlap the longitudinal boundaries of the opening on the lens side of the pack, the strips being caused to adhere to the body of the envelope and to the light-excluding sheet, which, as the pack is furnished to the trade, closes such opening. Other strips similarly cover and seal the transverse edges or the ends of the opening of the front or lens side of the pack, and the entire ends, front and rear, of the pack. At the tab end of the pack where the tabs of the individual film-moving strips or envelopes are folded down upon the exterior of the pack, the strip is carried over and somewhat beyond said tabs, and cemented to the back of the light-excluding wrapper. After being thus sealed, and to guard against any possible opening remaining, the entire pack is immersed in or otherwise coated with a film of cellulose nitrate or other waterproof cellulose derivative.

The cartridge or the film pack prepared as above described does not require the usual outer wrapper of coloured paper and metallic foil, nor the paper or cardboard envelope, though either or both of these may be retained if desired.

The film may after exposure and development be re-wound upon its spool or support with the waterproof wrapper and envelope, and resealed hermetically by the adhesive strips or bands removed at the time of placing the cartridge, pack, or package in the camera, these being preserved for such subsequent use or reapplication. This is particularly desirable for explorers, travellers, and commercial photographers, who are frequently away for long periods without facilities for properly protecting or caring for films under customary conditions of use. Arthur Williams McCurdy, 83, Crescent Road, Rosedale, Toronto.

Commercial & Legal Intelligence.

A PHOTOGRAPHER'S FAILURE.—At the offices of the Official Receiver for the Croydon District, York Road, Lambeth, S.E., on Tuesday last, the first meeting of creditors was held under the failure *re* Theodore Frank Newman, of 2, Anerley Park, Anerley. The statement of affairs filed by the debtor showed gross liabilities amounting to £712 4s. 10d., of which £695 7s. 4d. was due to unsecured creditors. The assets consisted of cash at bank, 10s., and interest in patents and on contracts, £1,300, making a total of £1,300 10s., from which £16 17s. 6d. had to be deducted for the claims of preferential creditors payable in full, leaving the net assets at £1,283 12s. 6d., and showing a surplus of £588 5s. 2d. after payment of all debts. The debtor alleged his failure to have been caused through the stoppage of the demand for scientific films and stoppage of his research work owing to the war.

The Official Receiver's report upon the case was to the following effect: The receiving order was made on a creditor's petition, the act of bankruptcy being failure to comply with the requirements of a bankruptcy notice.

The debtor, aged thirty-three, stated that after assisting his father in his business of a photographer he worked from 1906 to 1909 as an assistant to firms of colour cinematographers.

In 1910 he commenced business on his own account at Harlington as a producer of scientific films, with a capital of £50, representing savings; he subsequently removed to the Rookery, Watford, then to the Haven, Merstham, then to Cricklewood, and in December, 1918, to No. 2, Anerley Park. From May, 1918, to November, 1918, he was employed by an aviation company as works chemist at a salary of £7 per week.

He first had recourse to moneylenders on February 8, 1917; since that date he has obtained further loans from other moneylenders at high rates of interest.

From October, 1918, to February, 1919, he patented inventions relating to sparking plugs for aeroplane engines and to a safe memo refill for pocket books; he also invented a process for purifying the air in telephone cabinets.

On May 30, 1919, he entered into an agreement for the sale of his interest in a rust-proofing invention for £250 cash, which he has received, and £500 fully paid in shares in a company to be formed within six months from that date. His services were to be at the disposal of the purchaser for a period of five years at a fee of £2 2s. for every day upon which he was employed; the company has not yet been formed.

For the past two years he has been under continual pressure from his creditors, and since March, 1918, actions for debt have been brought against him, and judgments obtained, by nine of his creditors, representing a total sum of about £330; one moneylender issued a writ for £80 against him on April 5, 1919, obtained judgment, and instituted the present bankruptcy proceedings.

The debtor did not keep any books of account. At his preliminary examination he stated that his assets were of uncertain value, and that he first knew he had not sufficient property to pay his debts in full about two years ago, when he had to borrow money from moneylenders to pay rent and other outgoings. Mr. Fredk. Seymour Salaman, chartered accountant, of 1 and 2, Bucklersbury, E.C., was appointed trustee.

NEW COMPANIES.

TUTILLS, LTD.—This private company was registered on June 18, with a capital of £5,000 in £1 shares. Objects: To acquire the business of showcard manufacturer, gold-blocker, and photographic dealer. The subscribers (each with one share) are:—A. G. Tutill, "The Thorns," Prestwich Park, Manchester, showcard manufacturer; R. Hirst, 48, Livesey Street, Levenshulme, Manchester, bookkeeper. Directors to be appointed by the subscribers. Solicitor: W. Proctor, 36, Brazennose Street, Manchester. Registered Office: 9, Swan Street, Manchester.

FOTOCO, LTD.—This private company was registered on June 25 with a capital of £10,050, in 10,000 preference shares of £1 each and 1,000 ordinary share of 1s. each. Objects: Photographers, etc. The subscribers (each with 300 shares) are: A. J. Dreydel, 36, Primrose Mansions, Prince of Wales Road, Battersea, S.W.11, gentleman; F. C. V. Laws, 10, Yarrell Mansions, W.14, photographer; C. F. Lee, C.M.G., Finsbury House, Bloomfield Street, E.C.2, gentleman. Directors: A. J. Dreydel, F. C. V. Laws, and C. F. Lee, C.M.G. Registered office: Finsbury House, Bloomfield Street, E.C.2.

PHOTOGRAVURE CO., LTD.—This private company was registered on June 18, with a capital of £1,000 in £1 shares (750 pref.). Objects: To carry on the business indicated by the title, and that of printers, stationers, publishers, advertising agents, etc. The subscribers (each with one share) are:—F. T. Corkett, Butter Hill House, Dorking, art publisher; P. Lacroix, 21, Farringdon Avenue, E.C.4, photogravure plate engraver. Directors: F. T. Corkett, P. Lacroix, and C. H. Crabtree. Solicitor: E. Betteley, 23, Surrey Street, W.C.2. Registered Office: 21, Farringdon Avenue, E.C.4.

JEROME, LTD.—This private company was registered on June 20, with a capital of £50,000 in £1 shares. Objects: To acquire all or part of the businesses of B. A. Gale, Gale's Studios, Ltd., W. Smith and Bayley's Studios, Ltd., and to carry on the business of photographers, dealers in cinematograph machines and films and photographic apparatus, film renters, picture theatre proprietors, etc. The subscribers (each with one share) are:—B. A. Gale, Glentwood, Hale, Cheshire, company director; W. Smith, 3, Granville Mansions, Shepherds Bush, W., company director. The first directors are B. A. Gale and W. Smith. Solicitor: J. G. Mahaffy, 29, Blackfriars Street, Manchester. Registered Office: 45-7, Oxford Street, Manchester.

Correspondence.

**** Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

**** We do not undertake responsibility for the opinions expressed by our correspondents.*

PHOTO BUTTON PLATES AND ACCESSORIES.

To the Editors.

Gentlemen,—I have a Cannon camera, and find great difficulty in obtaining photo button plates for this machine that are reliable as regards speed and uniformity of result. A tube of buttons often shows plates are a mixed batch, some requiring, even in bright sunlight, about five seconds exposure and others only two or three seconds. This, of course, quite upsets the operator's judgment and causes, on an average, 50 per cent. failures; and slow exposures are a nuisance. These plates are collodion, not so good as pre-war, and three times the cost. At Epsom recently I saw another operator of a Cannon camera who had some gelatine emulsion button plates, grand to work, quick snap in sunlight, half a second exposure in the shade. He said they were American plates, pre-war stock, and he could not get any more. We made a comparison test of the plates, used his developer in my machine, same light and distance and similar camera; results very different. He took me in about half a second and obtained a good picture. I took him with half second exposure and again five seconds, by watch; the first was no good at all and the second only passable. We tried again with my developer, with similar results.

The essence of successful button, brooch, and ferrotype (while-you-wait) picture business is a quick and reliable plate, one to catch your customer (or victim) while he or she "thinks about it." It's no use saying "Your photo in one minute, miss," if you have to take five minutes or more to do it. Cannot British makers compete with American, Danish, Norwegian, or German firms? The chance for British trade is *now*. Wake up, England; you are asleep (or dozing) in many industries to-day. I have written to many firms who do metal brooch stamping and the like to supply me with brooches and stands for button photos, and also to card and mount manufacturers, but get all sorts of excuses, such as "not their class of work," "men not demobilised yet for this special work," "can't spare the time," etc., and I myself want thousands if I can get them for peace time novelties for street ferrotype workers.—Yours faithfully,

F. WHEELDON.

239, Shernhall Street, Walthamstow.

Answers to Correspondents.

SPECIAL NOTICE.

In consequence of general reduced supplies of paper, as the result of prohibition of the importation of much wood pulp and grass, a smaller space will be available until further notice for replies to correspondents.

Moreover, we will answer by post if stamped and addressed envelope is enclosed for reply: 5-cent. International Coupon, from readers abroad.

The full questions and answers will be printed only in the case of inquiries of general interest.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

S. M.—The firm manufacturing sensitive ferrotype button plates here is the Quta Company, 252/256, Haydons Road, Wimbledon, S.W.

P. McN.—The mercury vapour lamp if of the gridiron pattern would certainly minimise the defects you complain of; it would also give more illumination. We cannot say what difference in exposure there would be, but in any case it would not be unduly prolonged. No alteration of the focussing would be necessary.

D. R. H.—The only way you can secure flatness in the cards is to take them down before they are quite dry and put them under light pressure. In this weather it would be advisable to put them in a 10 per cent. formaline solution for a few minutes, then rinse before hanging up. This will greatly reduce the danger of sticking together.

H. E. G.—We do not know the album to which you refer. Messrs. Johnson and Sons, Union Street, Southwark, London, S.E., make several forms of loose-leaf albums and other books, and might have something to suit. They make for the trade only, so that if they could supply you, you would have to order through a dealer or stationer.

O. and S.—For throwing down silver from hypo baths you require to use strong solution of liver of sulphur (potassium sulphide). If you write to Messrs. Johnson and Sons, Ltd., 23, Cross Street, Finsbury, E.C., they will send you a circular of instructions of the best way to throw down the silver and of preparing the precipitate for the refiner to deal with.

E. H.—1. We do not know where the thin tin can be obtained, but probably any tinplate worker could get it for you. We do not think, however, that it would be satisfactory for masks, as it would be very difficult to get it to lie flat. Tinfoil is used by many of the postcard firms, but we think you would find that the orange celluloid supplied by Messrs. Kodak, Ltd., Kingsway, W.C.2, for this special purpose more convenient.

W. G. A.—1. The safest and best way of cleaning lenses is to apply one or two drops of absolute alcohol with a soft piece of silk, but be careful to keep it away from the blacking of the lens cells. 2. We have never seen a blue stain from P.O.P. They are usually yellow; then they are, of course, very injurious. 3. So long as the bath fixes the plates quickly, say, in five minutes, and does not stain the films, the colour does not matter.

A. T. C.—The spots are due to over-washing in a warm temperature. Half an hour, with frequent changes of water, is ample in this weather. With regard to the quinine, it must be understood that the action is optical only, and that any other similar granular coating would have answered as well. Except in an emergency, the ordinary backings of red or black would be superior. There is no advantage to be gained by backing a film, since this is so thin that halation does not occur.

Focal Length in Enlarging.—In a fixed distance of 34 ins. from negative to paper, can you say, please, what focal length of lens would be required to enlarge from approximately 3¼ by 2¼ ins. to 5½ by 3½ ins.? Also, what minimum of camera extension would be necessary to use in such a case?—Ralph.

An eight-inch lens will give you the desired enlargement, with the negative and paper fixed 34 ins. apart, the camera extension with a rapid rectilinear would be as nearly as possible 12¾ ins. from negative to diaphragm.

W. G. A.—Metol, metabisulphite, hydroquinone and amidol should be kept dry. A convenient strength for soda sulphite and carbonate of soda is a 15 per cent. solution—that is, 3 ozs. dissolved in warm water and made up, after the crystals have dissolved, to 20 ozs. with water. Potass. metabisulphate is not very soluble. We should make it up in a 10 per cent. solution—that is, 2 ozs. dissolved in *cold* water and made up to 20 ozs. No objection to enlarging a negative that has been reduced, although very often, if it has been reduced with Farmer's reducer, its quality is not so good for enlarging.

C. H.—The following is used for tank development:—Metol, 30 grs.; hydroquinone, 80 grs.; soda sulphite, 6 ozs.; soda carbonate, 560 grs.; potass. bromide, 10 grs.; water, 80 ozs. Dissolve in the order given. This stock solution is double strength and requires to be diluted with an equal bulk of water for use. As the developer becomes weaker it may be strengthened with the undiluted solution. The developer will keep in the tank for a fortnight, after which it should be thrown away. Development should be complete in twenty minutes; when more time is needed the solution must be strengthened. The above quantities are for one gallon of dilute developer.

W. R.—If you have a folding focal-plane you must have the lens in a sunk mount. There is no other way of focussing. On the other hand, in a reflex there is no object in having the focussing mount except for the sake of a little extra extension, but with almost any reflex that we can think of there will be disadvantages which more than set off any advantage, chiefly the fact that very often the lens, if in a focussing mount, will foul the mirror. For general outdoor Press work, the folding focal-plane is used almost exclusively; it is rare to see a Pressman with a reflex, and we think that their choice is quite a good one, since with experience in focussing the folding focal-plane is much the handier and more efficient of the two types.

The British Journal of Photography.

The Oldest Photographic Journal in the World.

PUBLISHED EVERY FRIDAY. Established 1854. **PRICE TWOPENCE**

TERMS OF SUBSCRIPTION, POST FREE.

United Kingdom.—One Year, 10s. 10d.; Six Months, 5s. 5d. Three Months, 2s. 9d.

Canada ... ... Australia ... ... New Zealand ... ... South Africa ... ... United States of America South America ... ... India and Far East ... ... Continent of Europe ...	*One Year.* Thirteen shillings (13s.), or 3 dollars 17 cents, or 18 francs 50 cents, or 9 rupees 12 annas, or 6 yens 30 sens.
Federated Malay States, Borneo and Sarawak	5 dollars 57 cents.

Henry Greenwood & Co., Ltd., Proprietors and Publishers, 24, Wellington Street, London, W.C.2.

IMPORTANT NOTICE TO READERS.—Until further notice agents will supply the "B. J." to order only, as the high price prevailing for everything in connection with newspaper production prohibit the distribution of surplus copies for chance sales. It is therefore necessary in order to ensure the regular delivery of the "B. J." each week to place an order definitely with a dealer, newsagent or bookstall clerk, or to send a subscription to the publishers.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3088. Vol. LXVI. FRIDAY, JULY 11, 1919. Price Twopence.

Contents.

	Page
Ex-Cathedra	389
Some Items in the Use of the Vest-Pocket Camera	390
Practicus in the Studio. By Practicus	391
How to Prepare Photographic Solutions. By J. I. Crabtree	393
Local Views as Postcards. By C. Brangwin Barnes	395
The Photographic Correction of Negatives Taken Obliquely. By L. P. Clerc	396
Toning P.O.P. Proofs Without Gold	399
Exhibitions	399
Patent News	400
Forthcoming Exhibitions	401
Meetings of Societies	402
Commercial and Legal Intelligence	402
News and Notes	402
Correspondence—	
A Professional Photographic Assistants' Association	403
Answers to Correspondents	403

SUMMARY.

M. L. P. Clerc has worked out mathematically the conditions for the correction of an aerial negative taken obliquely to one taken vertically from the same view-point. (P. 396.)

Mr. J. I. Crabtree, in the instalment this week of his paper on the preparation of photographic solutions, deals chiefly with the making of fixing baths, and gives working instructions in an operation for which, in our experience, such instructions are much needed—namely, the compounding of the fixing-hardening bath of hypo, alum, sulphite, and acetic acid. (P. 393.)

In a contributed article Mr. C. Brangwin Barnes has some advice to give on the making of negatives for view postcards, urging the production of technically better negatives and the choice of a greater variety of subject for a given district. (P. 395.)

In his article this week "Practicus" deals with the choice and use of dry-plates from the standpoint of the portrait photographer, advising the use of a plate, whenever possible, considerably short of the maximum speed and of still slower plates when the working conditions permit. (P. 391.)

The camera of vest-pocket size, while not capable of replacing the ordinary half-plate and larger instruments, may nevertheless render useful supplementary service in outdoor and indoor photography of the "commercial" kind. There is little advantage in fitting a lens of larger aperture than *f*/6: a roll-film camera has the merit of being ready for instant use and of allowing a practically unlimited supply of sensitive material being taken. These and some further hints on the professional use of the vest-pocket camera will be found in a leading article on page 390.

The great development of scientific industries, among which are photographic materials and photographic lenses, is shown by the exhibition of British Scientific Products which remains open at the Central Hall, Westminster, until August 5. (P. 399.)

The manufacture of the emulsion-coated transfer paper sold as Kerotype is the subject of the specification included this week in Patent News. (P. 400.)

A real summer temperature may have its effect in the dark-room in the way of thick and foggy negatives due to the higher temperature of the developing solution (P. 389.)

Deterioration of the glass surfaces is a change to which many lenses, particularly some of the older anastigmats, are liable. It is a wise rule to keep lenses in tightly closed cases when not in use, or at any rate to provide a close-fitting cap for each end. (P. 389.)

A method of quickly ascertaining the exposure in enlarging has recently been described by a writer in an American contemporary. (P. 390.)

A few hints on the making of cloud negatives will be found in a paragraph on page 390

EX CATHEDRA.

Heat Fog. Although at the moment of writing there is a decided drop in the temperature, it may not be amiss to refer to a point which has come under our notice several times lately. Complaints have reached us of plates which had previously yielded bright images giving thick, foggy ones. This is in the majority of cases due to the high temperature of the developer, and is more likely to occur when the developer is kept ready diluted in bulk in the dark room, where it rapidly attains the temperature of the room, which in some cases has been over 80° F. Even when stock solutions are diluted immediately before use, the trouble may occur through the water becoming heated in the pipes. This happened in one case only with the first batch of plates, the water having been standing in the pipes for some hours. When fresh water came from the main the development was normal. When it is possible to procure ice a little may be used to keep the solutions at a normal level. Failing this, a little bromide solution may be added to the developer, and the developer also used of a less strength than in cooler weather. Any tendency to over-expose must be avoided, and this is best done by slightly reducing the aperture of the lens, as when working one is apt to forget that allowance has to be made for the stronger light we are now enjoying. In many cases a slower plate may be employed with advantage, but it must be remembered that such plates are rather quicker in attaining density, so that over-development must be guarded against.

* * *

Corrosion in Lenses. If lens users would acquire a little elementary knowledge concerning the nature and properties of glass, their instruments would stand a much better chance of keeping in good condition than they do at present. It should be known that what we call "optical" glass is made in a great variety of qualities, each of which is capable of taking its place in one or other of the many kinds of lenses. Some are as hard and impermeable as the glass we use for windows and tableware, while others are soft enough to be easily scratched or even dented, while injudicious polishing will quickly dim the exquisite surface upon the perfection of which so much depends. This is especially the case in some of the earlier anastigmats in which very soft and easily corroded glasses were used because others were not available. It is perhaps news to many people to learn that some glasses are so susceptible to damp that a single drop of water left upon the surface for a few hours will leave an ineradicable mark, while the presence of a film of condensed moisture will give rise to a general corrosion, which in mild cases shows in prismatic colours like those of a soap-bubble, and in severe ones as a yellow stain

accompanied by a distinct depolishing of the surface. Unfortunately, there is no cure for this evil, for even the maker of the lens cannot repolish it to the same accuracy of figure that it originally possessed. Forewarned is forearmed, and knowing what is likely to occur the prudent man does not allow his lenses to stand about exposed to the atmosphere, but keeps them in tightly-closed cases when they are not actually in use. Failing a case, which also protects the brass work, a well-fitting cap at the back as well as the front is an excellent protection.

* * *

Exposure in Enlarging. An American writer, the Rev. C. R. Lowe, has given particulars of a method for estimating exposures in daylight enlarging which has some features of novelty about it. Summarised, it consists of making a contact print from the actual negative to be enlarged from, using daylight for the purpose, and, of course, employing the same kind of paper as will be used for the large print. The apparatus is of the usual daylight type; that is to say, a window is blacked up leaving only an opening rather smaller than the camera back. Against this the camera is fixed, and the image projected upon an easel in the usual way. The problem is now how to establish a definite ratio between the exposure for the enlargement and that of the contact print. To do this a correctly exposed enlargement is made by the usual trial and error or strip methods, and the time taken with a certain stop (in the author's practice this is always $f/11$) is noted. For example, this may be 15 secs. with an enlargement of 1½ times. A second opening of about 10 x 8, with an easily moved shutter, is provided in the window board, and the contact print made at such a distance from this that the correct exposure is also 15 secs. It then follows that any other negative exposed in the same position and the same distance from the opening will yield a good print with the same exposure as will be required in the enlarger. Other magnifications than 1½ diameters will need the exposure to be increased in a definite proportion. A convenient table for calculating this will be found on page 407 of the current "B.J. Almanac."

* * *

Cloud Negatives. It is not a good practice to start out with the intention of making cloud exposure exclusively, as this tends to securing a number of negatives of very much the same character. It is better when out on other work to devote a plate or two to any particularly good cloud effect, and to make a note which can be transferred to the bottom edge of the plate as to the point of the compass at which the camera was pointing and the time of day when the exposure was made. Although it is possible occasionally to obtain good results on an ordinary plate without a yellow screen, it is much easier to do so with an orthochromatic plate and a proper filter. There is really no reason why the landscape photographer should ever expose an ordinary plate and many reasons why he should use colour-sensitive ones. It is a mistake to use too dark a colour screen for sky work, the K2 strength being quite sufficient to give the proper contrast. If a deeper colour be used the blue portions will come out practically black and the sky will look too heavy for the view. In our idea most sky negatives are too thin, as this adds considerably to the difficulty in printing them to the proper depth to suit the subject, particularly when enlarging or printing upon bromide paper. This often leads to an unnatural appearance in the finished print and causes some people to contend that a perfect result can only be obtained when the clouds are secured upon the same plate as the view. The real reason for this is that in this case the clouds have received full development, which can also be given with a properly screened plate. We may perhaps be allowed to remind those who are not experienced in this class of photography that it is always desirable to include a narrow strip of landscape below the clouds, so that the negative may not be used upside down. This has the additional advantage of preventing the camera being pointed to the zenith and the resulting clouds printed in near the horizon, a fault which has often been committed.

SOME ITEMS IN THE USE OF THE VEST-POCKET CAMERA.

As we have mentioned now and again in these columns the vest-pocket camera, now so popular with the amateur worker, is an instrument not to be neglected by the professional photographer. While it can never supplant cameras of much larger size which are employed on stands, it has supplementary uses for which its small size and optical performance particularly qualify it. There are many occasions when photographs turn out to be required in addition to those which the photographer has equipped himself to take. A vest-pocket camera with an ample supply of plates or roll-film occupies an insignificant space in the larger kit, yet is able to turn out work which can be quite satisfactory for commercial purposes. In other conditions the possession of the small camera may encourage the photographer to take negatives speculatively: the time and cost thereby involved are small, and will often be repaid by the orders secured. From these considerations some thought may well be given to the choice of a camera of this size and to the best methods of using it.

In regard to the camera the first essential is that it should be of the finest mechanical construction and fitted with a lens as good as can be had. In an instrument of this small size, where a difference of a minute fraction of an inch may spoil the definition, it is bad policy to buy a camera which does not provide a thoroughly rigid and square position of the lens in respect to the plate or one which is liable to develop defects with use. There is fortunately considerable choice. The purchaser may choose between cameras of the folding focal-plane pattern, in which the lens front is held forward by a system of rigid struts, and those of the folding baseboard type. In both classes instruments are to be found which are beyond criticism in their mechanical construction. As a rule makers fit a lens of $f/4.5$ aperture, and in many circumstances there is an advantage in this maximum speed. Moreover, $f/4.5$ is the fashion, and a camera of this aperture is much more saleable, if one wants to dispose of it, than one of $f/5.6$ or $f/6$. Nevertheless, for such commercial photography as may be undertaken with a vest-pocket camera, there is little to be gained in having a larger aperture than $f/6$. The negatives are taken with a view to enlargement to whole-plate size, and for this purpose the greater depth and more acute definition at $f/6$ are recommendations for this aperture. As regards focal length we are largely in the hands of the manufacturers, but it may be said, even if a camera can be found, there is no object in having a lens of focus shorter than three inches. Rise of front, if it can be had, is certainly an advantage at times, but most cameras of this size are without it. Thus, where the camera has to be tilted in order to include parts of a subject which contain vertical lines, recourse must be had to correction when enlarging by the customary method of tilting both the negative and the bromide paper towards each other.

For various reasons roll-film is a sensitive material for the vest-pocket camera to be recommended. The camera is ready for use at a moment's notice, development of the small negatives is more readily done and without touching

hem than when plates are used, and it is the experience of many that minute mechanical defects of manufacture are of less occurrence in these small roll-films than in plates of the same size. It may be urged that the use of roll-film prohibits focussing on the ground glass, but in any case the image on a vest-pocket camera is really too small to be seen satisfactorily, and it is quite safe to rely for the arrangement and focussing of the image upon a tested direct vision finder and focussing scale.

The great merit of the vest-pocket camera for many descriptions of commercial photography, and particularly of indoor subjects, is the combination of rapidity and depth of focus which results from the use of such a short-focus lens. As the reader can readily reckon for himself a 3-in. lens of f/4.5 corresponds, as regards depth of focus, with a 10-in. lens at f/16, whilst the former has the advantage over the latter as regards shortness of exposure of more than twelve times. In other words, for work such as the indoor photography of machines and similar subjects, the user of a vest-pocket camera is able to make a whole series of exposures during the time that one plate is being exposed with his half-plate or whole-plate outfit. A light tripod is almost necessary for this work, although some commercial photographers that we have known carry a little fitting on the head of the ordinary tripod consisting of a grip for a vest-pocket camera. In photographing, even on such a small scale as 60 x 45 mm., the mistake must not be made of getting too close to the subject. It is by so doing that the results with the small instrument are likely to be condemned as unsatisfactory. The drawing or perspective of a solid object is conditioned by the distance of the lens from it. While its near view-point is the least satisfactory element in the use of the vest-pocket camera a rendering of the subject, which would be defective from this cause, will be better as the camera is used farther away. At the same time, with the correct adjustment of the focussing scale, depth of definition will be correspondingly greater and the enlarged print show to correspondingly better advantage as regards detail.

A general all-over sharpness is the greatest merit a vest-pocket camera negative can possess, and if care is taken when focussing there ought to be no difficulty in making whole-plate enlargements perfectly sharp from corner to corner from each negative, but the definition in the first place must be needle sharp. Perhaps the most formidable difficulty in the way of making large prints from the tiny negatives is the grain of the latter. Much may be done to avoid this grain by the use of plates of somewhat slower speed, and by the employment of a developing formula which results in an image of finer grain. The Wellington borax metol-hydroquinone developer is a most satisfactory formula for this purpose, and it is hardly necessary to point out that, as in the treatment of any plate, unforced development is a condition for the production of a silver image of the finest grain.

As regards enlarging, it need only be said that where enlarged prints over whole-plate size are required a certain amount of working-up may be necessary. Such work on the small negatives is very inadvisable; the better plan, apart from simple spotting, is to make an enlargement upon smooth bromide paper, and work upon that. A copy negative is then made from the worked-up enlargement upon a plate of the same size.

PRACTICUS IN THE STUDIO.

[Previous articles of this series, in which the aim of the writer is to communicate items of a long experience in studio portraiture, have appeared weekly since the beginning of the present year. It is not thought possible to continue the series to the length of that by the same writer which ran through the "British Journal" some years ago, but if any reader among the younger generation of photographers, and particularly those engaged as assistants, has a particular subject which might be dealt with, his or her suggestion will be welcomed. The subjects of the previous articles of the series have been as follows :—

A Talk About Lighting (Jan. 3).
The Camera and the Lens (Jan. 10).
Managing the Sitter (Jan. 17).
Backgrounds (Jan. 24).
Studio Exposures (Jan. 31).
Artificial Lighting (Feb. 7).
Printing Processes for Portraiture (Feb. 14).
Studio Accessories and Furniture (Feb. 21).
The Surroundings of the Studio (Feb. 28).
Studio Heating and Ventilation (March 7).
The Postcard Studio (March 14).
The Printing-Room (March 21).
About the Reception Room (March 28).
Home Portraiture (April 4).
Portable Studios (April 11).
Copying (April 18).
Handling the Studio Camera (April 25).
More About Lenses (May 2).
Enlargements (May 9).
Advertising the Studio (May 16).
Mounts and Mounting (May 23).
Business Methods (May 30).
Photographing Children (June 6).
Portraits of Elderly People (June 13).
Something about Lenses (June 20).
Hand Cameras for Professionals (June 27).
The Dark-Room and Its Fittings (July 4).

PLATES AND THEIR WORK.

My experience of photographic plates goes back to the time when the only kind of dry plate upon the market was of the collodion variety, although experimenters were busy with gelatine, which it was hoped might ultimately be made as rapid in action as wet collodion. Even when a satisfactory plate was made it had a hard fight to get into the professional portrait studio, mainly because the handling during development and fixing was so widely different from what we had been accustomed to. Besides this the plates themselves were by no means uniform in speed and quality, and the unhappy operator never knew whether to blame himself or the plate-maker for a failure. I need hardly say that he usually did the latter, as some do even now, although I think that nowadays one may safely say that there are no bad plates; some kinds may suit a particular worker's methods better than others, but all are capable of giving good results if handled in the right way.

The quality of a negative does not seem to be so much regarded as it was in earlier days, when albumenised paper was the only printing medium, and a decent negative was necessary to get any brilliancy of image and beauty of tone. Now any old sort of image is passed, and it is left to the printer to find, out of the hundred and one sorts on the market, a paper which will yield a print which the customer will not reject. This is mainly due to carelessness in exposure and development, but

also in some cases to the choice of a plate which is unfitted to the particular job.

So far as my experience goes there is no single grade of plate which will give the best results with all classes of work, yet we find plenty of photographers who do not realise this, and do portraits, interiors, and copies on identically the same emulsion. That the results are as good as they frequently are speaks volumes for the operator's skill; but they would be much better if a second, or even a third, variety were kept ready for use. The fact that all our best plate-makers issue a number of grades of plate which differ not only in speed but in the quality of the image ought to make it clear that the "universal" plate does not exist, for if it could be made it is pretty certain that the plate-makers would make that grade only.

Failing this, we must select from the various plates at our command those most suitable to the work to be undertaken. In my opinion (others may differ) the slower the plate used, the more satisfactory the result, for the reason that, as a rule, slow plates allow far more latitude in exposure, and therefore better printing negatives can be obtained. I do not for a moment wish to deprecate the value of even the most rapid plates for their proper work, only their use on such subjects for which speed is not necessary, and especially where such contrasts exist that certain portions must be over-exposed in order to secure detail in others. Even in portraiture, for which ultra-rapid plates are usually chosen, it is not always wise to use them if really fine quality is wanted. It is true that the rapid plates give full detail, and apparently satisfactory quality, but if a little more exposure could be given a slower plate would give a better modelled image with finer printing quality. This is especially the case where there are white or very light draperies, which lose all their sparkle if the other parts of the picture are adequately exposed. Therefore, it is wise to be content with a plate not faster than 200 to 250 for the majority of portrait negatives, and to reserve those of higher speeds for children, animals, and for ordinary sitters in a bad light. For outside work they should only be used for fast shutter exposures. It has been stated by some hand-camera experts that the speed number of a plate, even if correct, is not of itself a safe guide to its image-producing capacity, for a rather slower plate may under trying circumstances give an image of some printing value, while the rapid plate gives a negative showing slightly more detail, but which cannot be forced up to printing strength. Another defect in most very rapid plates is the coarseness of the grain, which renders them quite unfit for any considerable degree of enlargement.

For general outdoor work my limit of speed is 250 H and D, and this I should employ only for groups which required a small aperture, and for shutter exposures, on horses, cattle, and the like. Whenever circumstances permit I prefer the "ordinary" speed, which is about 100 H. and D. With this it is possible to expose for four or five times the correct time and still get a good negative by straightforward development. For interiors or other subjects showing strong contrasts, such as white buildings among dark trees, the slow plate scores again, for it will give detail in both light and shade, while the rapid one would have given a flat result in the lights by the time the shadows had got enough. I am, of course, assuming that development is properly carried out, because very rapid plates are often accused of giving thin images, the fact being that such plates require a much longer time to attain full density than slower ones do.

For copying it is usual to employ slow plates, and the ordinary grade usually gives a satisfactory result with all except line subjects, such as pen-and-ink drawings, letters, printed matter, and the like; to get the best results with these and with any monochromes which are flat or lacking in contrast, process plates are a necessity. I had recently to copy a very badly faded silver print, and after various trials with ortho-plates, with and without screen, decided to try a "process" with which I obtained a very fine negative; the paper was quite yellow and the image faint brown, yet in spite of theory the result was most satisfactory.

Ortho plates are not as generally used as they should be. Used without a colour screen they will do all that an ordinary plate will do, and with a screen they will give results otherwise impossible. They should be used for such work as flowers, trimmed hats, and fashion work generally, and, of course, for all coloured prints, water-colours, and light oil paintings. Type-written letters, which are usually in violet ink, need a somewhat deep yellow screen, such as the K. 3, to give sufficient contrast. Panchromatic plates may be considered as super-ortho plates, as they are practically sensitive to all colours. They are indispensable for such subjects as furniture, dark oil paintings, fabrics with patterns in strong colour, and for very difficult portraits. The most freckled sitter will come out with a perfect complexion on a panchromatic plate with a K. 2 screen, and light-blue eyes are rendered in their true values.

To obtain the best results on any subject with strong contrasts backed plates should be used, for it is not fair to the emulsion to allow the high-lights to be choked up by halation. It has been stated that backing reduces the speed of a plate, but this I can positively assert is not the truth. A brighter image is certainly obtained, and this may have given rise to the impression, but so far as detail in the shadows is concerned I have found that there is no advantage in using an unbacked plate, while the rendering of the high-light detail is always greatly superior, this being considered quite apart from the absence of blurring or halation as is generally understood.

As a concluding hint I would say, choose a good brand of plate, master its working thoroughly, and do not forsake it without good reason. Plates have their little ways, and so have operators, and the great point is to see that these fit in together. Some plates develop more quickly than others; some work better with a warm developer which would fog another brand. These things must be found out and carefully noted, and many failures and half-failures will be avoided.

PRACTICUS.

THE CONVENTION OF THE AMERICAN PHOTO-ENGRAVERS' ASSOCIATION.—For their annual convention on June 19, 20, and 21, at Buffalo, New York, the executive certainly had an excellent programme scheduled, for, in addition to the usual routine business of these meetings they selected all the prominent men in the industry to speak on topics with which they are specially familiar, and which are of importance to the trade at the present time. The subjects were divided into four main heads—"Production," "Advertising and Selling," "Executive and Administration," and "Labour Policy." Under "Production" were papers on "How to Reduce Costs of Production and Selling Price," by five authors (one of whom, we observe, is an old-time contributor, Mr. A. J. Newton), also several papers on "Standardising Shop Methods and Practice," and "Standardising Three-Colour Inks." It is a relief to see that technical problems receive some attention as against the perennial question of price, though this, of course, was not neglected, and papers were down for reading on "Differential Discounts and Prices," "Fair and Unfair Competition in Selling and Buying," "Proper Charges for Overtime," and five aspects of the problem of "The Middleman." A sign that the Labour problem is as acute in the United States as it is here is the fact that the president of the Trade Union was invited to speak on the "Aims and Objects of Organised Labour," that the secretary of the Employers' Association spoke on "Our Relations With Labour," that two employers spoke on "Profit-Sharing and Bonus Systems," and five leading employers spoke on "The Forty-Four Hour Week," which faces the trade in America next year. We hope to give some of the conclusions arrived at by this Convention as soon as they are to hand.

HOW TO PREPARE PHOTOGRAPHIC SOLUTIONS.

[In the following paper, previous instalments of which have already appeared, Mr. J. I. Crabtree of the Eastman Research Laboratory, deals in a most explicit and comprehensive way with the practical methods of making up photographic solutions in bulk and with the chemical proportions which require to be taken in accordance with the properties of the substances which are being handled. Although contributed for the information of cinematograph photographers to the "Motion Picture News" there is scarcely a single paragraph of it which does not apply to the customary operations of any photographer working upon a reasonably large scale; and there is, we think, no photographer so fully expert in the compounding of such solutions as developers, fixing baths, etc., who will not get some practical hints from it.—Eds. "B.J."]

(*Continued from page* 382.)

How to Mix Fixing Solutions.

Fixing baths may be divided into the following classes:

1. Plain hypo solutions.
2. Acid hypo solutions consisting of hypo, with the addition of sodium bisulphite, potassium metabisulphite, or sodium sulphite with acid.
3. Acid hardening hypo solutions.

1. No difficulty is usually experienced when mixing a plain hypo solution. When mixing a quantity of solution in a tank the filter-bag method should be used and the hypo dissolved in warm water, because the temperature drops considerably while the hypo is dissolving. If a scum forms on the surface of the solution on standing this should be removed by drawing the edge of a towel across the surface.

If a wooden cover is used for the tank, fungi often develop in a hypo solution and produce acid substances which tend to turn the solution milky. In such a case the tank should be thoroughly cleaned, and the cover faced with sheet lead.

A plain fixing bath, however, is seldom used, because it gradually becomes alkaline from an accumulation of alkali carried over by prints and plates from the developer, and this tends to soften the gelatine while the image continues to develop in the fixing bath, so that if two prints stick together more development takes place at the point of contact, causing uneven development. If the bath is acid, the acid kills or neutralises the alkali in the developer carried over, thus preventing unevenness.

2. In order to be able to mix an *acid fixing bath intelligently* it is necessary to understand a little about the chemistry of the acid-fixing bath.

Hypo can be made by boiling together sodium sulphite and flowers of sulphur until no more sulphur is dissolved. If acid is added to a hypo solution sulphur is again liberated, forming a milky solution known as milk of sulphur. If sodium sulphite is present, however, any sulphur which tends to come out of solution combines with the sulphite to form more hypo, and the solution therefore remains clear.

This sulphur cannot be redissolved by adding sodium sulphite to the milky solution except by boiling, while on standing it is apt to settle on prints or plates as a scum. All acid-fixing baths therefore contain either sodium bisulphite, potassium metabisulphite, or a mixture of sodium sulphite and some acid, and the following directions for mixing should be followed:

(a) Do not add the bisulphite or acid sulphite solutions to the warm hypo solution. The solutions should be perfectly cold when mixed, or the hypo will turn milky.

Experience has shown that potassium metabisulphite has less tendency to produce milkiness than sodium bisulphite, though for practical purposes the difference is almost negligible.

Of the common acids, sulphuric, hydrochloric, acetic, citric, etc., acetic, citric, and tartaric acids have less tendency to produce milkiness for a given degree of acidity than sulphuric, which fact would be expected from theoretical considerations.

(b) On keeping, an acid hypo solution gradually becomes milky, so that a stock solution of the sodium bisulphite, etc., should be kept and added to the plain hypo stock solution as required. For general purposes 50 c.c.s. of a 50 per cent. sodium bisulphate solution are added to 1,000 c.c.s. of a 35 per cent. hypo solution. If any considerable excess over this amount is added, the hypo rapidly turns milky owing to the liberation of sulphur, especially in warm weather.

3. *Acid hardening baths* are prepared by adding to hypo an acid hardening solution which contains the following ingredients:

(a) An acid such as acetic, citric, tartaric, lactic, sulphuric, etc., which stops development.

(b) A hardening agent such as alum, chrome alum, or formalin.

(c) A preservative such as sodium sulphite or sodium bisulphite.

The latter acts as a preservative in two ways. It prevents the formation of sulphur by the action of the acid on the hypo, while it also prevents the developer carried over into the fixing bath from oxidising and turning brown.

How to Mix the Acid Hardener.

Prepare the acid hardening solution as to separate stock solution, and add this to the hypo solution as required.

The order of mixing is important, as follows:

(a) When mixing in one vessel, first dissolve the alum in warm water, then add the acid and add the sulphite immediately, otherwise if the acid alum solution is allowed to stand the alum will crystalise out again. It is sometimes recommended to reverse the process, namely, dissolve the sulphite first, add the acid, and then the alum, but unless the alum is finely powdered this does not readily dissolve unless the solution is warm, in which case sulphur dioxide gas is given off from the acid sulphite solution.

(b) The best method is to dissolve the alum and sulphite in separate solutions, cool, add the acid to the sulphite, and then add the alum solution.

If the order of mixing is reversed, and the alum first added to the sulphite, a white sludge of aluminium sulphite is formed which dissolves with difficulty when the acid is added. Therefore if after mixing the hardener is milky and a sludge settles out, this is due to a relative insufficiency of acid, that is the acid used was either not up to strength, or too much alum or sulphite was added.

With all other hardening baths the order of mixing is the same.

Fixing Bath Troubles.

1. *Milkiness of the Fixing Bath.*—Sometimes a fixing bath turns milky immediately on adding the hardener, and sometimes after being in use for some time. The milkiness may be of two kinds:

A. If the precipitates settles very slowly on standing, the milkiness is due to sulphur, and may be due to the following causes:

(a) Too much acid in the hardener.

(b) Too little sulphite or the use of impure sulphite, in which case there is not sufficient present to protect the hypo from the acid.

(c) High temperature. The hardener should only be added to the hypo solution when at room temperature. If the temperature of the acid fixing bath is over 85° F., it will not

remain clear longer than a few days even when mixed correctly. The only remedy is to throw the bath away, and mix fresh solution as required.

B. If the milkiness disappears on standing for a few hours, and a gelatinous sludge of aluminium sulphite settles out, this is caused by:

(a) Too little acid in the hardener. For example, supposing a formula calls for pure glacial acetic acid, and 28 per cent. acid is used by mistake, then we have added less than one-third the required amount.

(b) Too little hardener in the fixing bath. When fixing prints, a relatively large proportion of the developer is carried over to the fixing-bath, which soon neutralises the acid, and therefore permits of the formation of aluminium sulphite. In the same way a fixing-bath with the correct proportion of hardener when exhausted, still contains alum and sulphite but no acid, and these combine to form a sludge of aluminium sulphite.

It is extremely important therefore to use only acid of known strength, because trouble is caused if we use either more or less acid than is called for in the formula.

2. *The Bath Does Not Harden.*—A frequent cause of insufficient hardening is the use of inferior alum which does not contain the correct proportion of aluminium sulphate. An exhausted bath which is alkaline will also harden very slowly, since alum hardens best only in acid solution.

Substitution of Chemicals.

Occasion often arises when the photographer is out of stock to some particular chemical, and he is tempted to substitute the chemical by another. In this chapter it will be shown how far substitution is possible in the case of developing and fixing baths, though the remarks will usually apply also to solutions in general.

In view of the present scarcity of potassium salts and their greater expense as compared with sodium salts, the question arises as to what extent they can be replaced by salts of sodium or ammonium.

As a general rule, for photographic purposes, a potassium salt can be replaced by a sodium salt weight for weight, the error caused by the difference in molecular weight of the two salts being usually negligible. There are many exceptions, however, where there is a difference in the physical properties of the two salts for example, potassium carbonate and sodium bichromate are deliquescent, while sodium carbonate and potassium bichromate are not.

Substitution in Developing Formulae,

1. *The Developing Agent.*—As a general rule it is not possible to replace one developing agent by another and obtain a developer with identical properties, because each developing agent has its own characteristics as regards rate of development, for colour of image produced, etc. In some cases, however, a close approximation can be made, for example by substituting Elon by Kodelon (or paramidophenol) providing the developer is sufficiently dilute to permit of sufficient paraminophenol being dissolved. This applies either to an all Elon or an Elon-hydroquinone formula.

If in an Elon-hydroquinone (or E-H) formula paraminophenol is substituted for the Elon and the activity of the developer is increased by the addition of alkali, the effect of the alkali is proportionately greater on the hydroquinone than on the paramidophenol so that a rapid hard-working developer is obtained. To avoid this, proportionally more paramidophenol is required than if Elon is used.

2. *The Preservative.*—It is now customary to substitute sodium bisulphite for potassium metabisulphite weight by weight, though in a plain fixing bath-sodium bisulphite has a slightly greater tendency to produce sulphurisation than the potassium salt.

The question is often asked as to the difference in action between sodium sulphite and sodium bisulphite. Sodium bisulphite may be considered as a compound of sodium sulphite and sulphurous acid, and therefore reacts acid, while sodium sulphite is alkaline, so that in the case of a two-solution pyro formula where the pyro A solution is preserved with oxalic acid or sodium bisulphite, an equal weight of sodium sulphite would not preserve so well since pyro oxidizes much more readily in alkaline than in acid solution.

In the case of a one-solution developer containing, say, sodium sulphite, sodium bisulphite and sodium carbonate, the bisulphite is converted to sulphite by the sodium carbonate, according to the following equation:—Sodium bisulphite + sodium carbonate = sodium sulphite + sodium bicarbonate; so that a corresponding amount of sodium sulphite might just as well have been added in the first place. Sodium bisulphite also neutralises or destroys an equivalent amount of sodium carbonate, thus reducing the proportion of alkali, and therefore exerts an apparent restraining action, while the developer apparently keeps longer because some of the carbonate has been destroyed. The relative amounts of the different salts which produce the same preserving action is given in the following table:

Sodium sulphite	1.0 parts
Sodium bisulphite	8.3 parts
Potassium metabisulphite	0.88 parts

For a two-solution developer therefore use sodium bisulphite, but in an case of a single solution developer containing alkali use sodium sulphite, because in this case no advantage is gained by using a mixture of sulphite and bisulphite.

3. *The Alkali.*—The common alkalis are the carbonates and hydroxides of sodium, potassium, or ammonium. Substances like acetone, tribasic sodium phosphate, borax, and amines are occasionally used, but will not be considered here.

When sodium carbonate is dissolved in water a small proportion of it reacts with the water forming caustic soda and sodium bicarbonate; this is called hydrolysis, though only a small portion of the carbonate is hydrolysed at any moment. As the caustic soda formed is used up in development, more carbonate hydrolises so that we can consider that carbonate acts as a reservoir of caustic alkali. If in the first place a solution of caustic soda was used of the same alkalinity as the carbonate this would soon be used up. The use of carbonate therefore enables us to use a small concentration of alkali, and yet keep it constant during development.

It is rarely possible therefore to replace caustic alkalis by carbonated alkalis such as sodium or potassium carbonate.

Potassium carbonate is slightly more active than sodium carbonate in solution because it hydrolyses to a greater extent. For developing motion picture film on a reel when the developer may splash on the floor, potassium carbonate cannot be substituted by sodium carbonate since, because of the deliquescent nature of potassium carbonate, the splashes of solution remain moist thus preventing the formation of carbonate dust in the air.

Caustic soda and caustic potash may be replaced weight, for weight in most formulæ.

Ammonia and ammonium carbonate are seldom used in developers on account of the odour, and the fact that they tend to cause dichoric fog.

Desiccated and Crystal Sodas.

Sodium carbonate and sodium sulphite are often supplied in two forms: Crystals and the desiccated on dry variety, which is sometimes called anhydrous, because it does not contain water of crystallisation.

Desiccated sodas possess the advantage that they occupy less than half the bulk of the crystals, while desiccated sodium sulphite is much less liable to oxidation by the air than the crystalline variety.

The sodas should be substituted as follows:

One part by weight of sodium carbonate (desiccated) for three parts by weight of the crystals.

One part by weight of sodium sulphite (desiccated) for two parts by weight of the crystals.

4.—*The Restrainer.*

Potassium bromide may be substituted by an equal weight of sodium bromide. Ammonium bromide should not be used in a developer because the alkali liberates ammonia gas, and this tends to produce dichoric fog as above.

Substitution in the Fixing Bath.

Sulphites and Bisulphites.—The same remarks apply as to preservatives in the developer.

Alums.—An alum is a compound or double salt of aluminum sulphate or chromium sulphate with either sodium, potassium or ammonium sulphate. The hardening action is only produced by the aluminium or chromium sulphate, so that equivalent weights of aluminium sulphate and of sodium, potassium, or ammonium alum should exert the same hardening action.

As a result of a series of practical tests by the author, the following conclusions have been drawn:

(a) Equivalent amounts of potash alum and aluminum sulphate exert the same hardening action, two parts by weight of aluminum sulphate, being equivalent to three parts by weight of potash alum. Commercially pure aluminum sulphate is satisfactory if this does not contain an excess of iron, though if the sample is acid the solution should be neutralised with ammonia. When mixing the usual liquid hardener formula with commercial aluminum sulphate, a slight milky suspension is formed which should be allowed to settle and filtered off.

(b) There is no appreciable difference between sodium, potassium and ammonium alum in their hardening action when substituted weight for weight in the usual formulæ. In practice, if any difference in hardening action occurs, this is due to the use of impure alums, in which case, providing the impurities are harmless, an increased amount of the alum should be used so that its content of aluminum sulphate is the same as that in the potash alum called for by the particular formula.

When using ammonium alum, if the fixing bath becomes alkaline by virtue of a neutralisation of the acid by the developer carried over, ammonia will be liberated resulting in the production of dichroic fog and stain. No trouble will be experienced, however, if care is taken to keep the bath acid.

Pure chrome alum may also be substituted for potash alum, as above, though it has a slightly greater tendency to precipitate sulphur than potash alum. It has the advantage, however, that it does not form a basic sulphite as rapidly as potash alum, so that a chrome alum fixing bath remains clear even when appreciably alkaline.

Acids.—The most commonly used acids are acetic, citric, tartaric, and sometimes lactic acid. Strong acids like sulphuric are seldom used because of the great tendency to liberate sulphur. Weaker acids like the above bear the same relation to a strong acid as a carbonated alkali to a caustic alkali, that is they act as a reservoir of acid, so that only a small portion of the acid is available for reaction in solution at any one time.

Acetic acid is usually supplied in two strengths, glacial (98 per cent.) and 28 per cent. acid, so that one volume of glacial acid is equivalent to three and a-half volumes of 28 per cent. acid.

Citric and tartaric may be substituted weight for weight and when used in place of acetic, substitute in the ratio of one gram of citric for every 3 ccs. of 28 per cent. acetic acid.

However these acids are not quite so satisfactory as acetic because for a given degree of acidity as measured by the amount of alkaline developer which can be added to the fixing bath before the bath becomes neutral, citric and tartaric acids have a greater tendency to precipitate sulphur from the hypo than acetic acid.

J. I. Crabtree.

(*To be continued.*)

LOCAL VIEWS AS POSTCARDS.

When local view postcards were first introduced, I was among the first to prophecy that it was not likely to be a passing fancy or a craze for the moment; it seemed to me then, and it seems to me now, that the trade, once introduced, had come to stay, and although from three or four causes the trade has fallen off of late, there seems to me no doubt whatever that directly these causes are removed there will not only be a thorough revival of business in this line, but a steadily growing increase in the output. The causes which have led to the decreased sale not only of local view postcards but of pictorial postcards generally, have been, first, the war and the general upheaval of business all round consequent upon the same. Secondly, the great and ever-growing increase in the cost of all materials and the shortage of supplies of glass, paper, and chemicals, which necessitated an increase in the price of the finished cards, and on the top of the dearer card came the extra postage. Where a card could be bought for a penny and posted to any address in the United Kingdom for a halfpenny—a total cost of three halfpence—it now costs threepence or sometimes twopence halfpenny, whereas a letter of several sheets and weighing as much as four ounces could and can be posted for three halfpence. And now, six months after the signing of the Armistice, the postage rate on a postcard still remains at a penny. This high rate has done more harm to the postcard trade than has arisen or is likely to arise from any other cause or from all other existing causes combined. Surely it is time that the Government saw fit to revert to the old halfpenny postage on postcards; the extra halfpenny on a letter we do not grumble at, although it is an increase of 50 per cent., whereas the postcard rate is increased 100 per cent. If all the producers and publishers were to combine and, together with the retailers, approach the Government on the matter, there seems a reasonable hope that this 100 per cent. tax may be removed. It should be mentioned that if the superscription "Postcard" be struck out and replaced by "Printed Papers," and the message limited to five words of conventional character, a pictorial card may be sent at the halfpenny rate. Another cause of decreased demand in postcards was D.O.R.A.'s enactment that no photograph should be sent to any neutral country. This is, of course, now obsolete, but whole armies of Belgians and others who were in this country have now returned without having purchased any of the many thousands of photographic postcards which they would otherwise have done. A further cause of bad sales has been another of "Dora's" rulings which prohibited outdoor photography, and so stopped the taking of fresh views. Any dealer in postcards will tell you that the infusion of a few new subjects with the old periodically gives a considerable impetus to the sales, besides which no self-respecting stationer likes to keep the same old views in his window month after month, season after season, and year after year; even one or two new ones mixed in occasionally make a change and draw attention, whereas the public seeing nothing fresh pass on without a second glance.

In all probability we shall never get back to the penny (photographically produced) postcard; but if the price is in the future to remain at twopence, or even three halfpence, the sale will still be a good one if we endeavour to improve upon the pre-war penny article.

Undoubtedly the present postcard can be improved upon in more ways than one. The first improvement that suggests itself is that the card itself should be considerably heavier or thicker than that in general use at present, and which is very often but little stouter than ordinary drawing paper. These very thin cards do not make a good show in the window or in the stand, as they curl inwards and

look, to say the least of it, untidy. I have more than once heard dealers say they would rather pay a slightly higher price for a thicker card, and they would undoubtedly appeal to the public. Then why is it that nine out of every ten publishers print the cards flat, or, in other words, full out, which gives the prints, unless they are guillotined, an untidy look. And it should be borne in mind that a guillotined print is almost invariably under the regulation size allowed by our grandmotherly postal officials, and this, when discovered by the aforesaid G.P.O.s, results in a surcharge of another halfpenny on each card so discovered, and payable by the recipient. When a postcard is printed right out to the edges, these edges always present a rough and unfinished appearance, which does not occur when printed with a narrow white border, and it is somewhat astonishing what a difference in the general appearance of the card results from the varying width of the border; where bordered prints are issued the usual width is one-eighth of an inch, while in some cases it more nearly approximates to the quarter. Now, just take one of these cards and retrim so that the white border is only one-sixteenth of an inch, and note the astonishing improvement in the effect. Surely it is very little more trouble to print with that width of border than with the greater, to which may be added the further advantage accruing from the increased size of the picture itself, often enabling the top of a church steeple, or other high building, to be included without unnecessarily cutting off the foreground. Some care is needed in placing the bordered negative in the printing machine so as to ensure an *even* sixteenth of an inch *all round*, as nothing looks worse than a wide border on one or two sides and a narrow one on the others.

Another improvement I would advocate is in the matter of skies. Here perhaps the improvement may add a trifle to the cost of production, but a trifle which will be amply repaid by the improvement in the resulting prints, and consequently an improvement in their popularity. The terribly crude white skies which almost everywhere obtain must be an eyesore to the person with any art education, and when it is remembered that a dead-white is not a correct rendering of even a clear and cloudless blue sky, it will be seen that the photographer who wishes to improve his work, and incidentally his output, has here scope for a very material improvement. A grey sky (printed through) is almost as bad as a dead-white, and the alternative presents itself of introducing artificial clouds, or, at any rate, clouds by artificial means. But how is this to be done on a cheap bromide postcard? queries the printer. Well, I said it would cost you more, and I would suggest the following as the best *modus operandi*:—The negative should always be taken of a larger size than a postcard. A half-plate will do, but a whole-plate is much better, and from this a perfect print should be made and *suitable* clouds printed in. From this print a second negative should be made, which will, of course, include the clouds, and note here that all negatives from which hundreds or thousands of prints may be required should be varnished. The system of rubbing down the opaque sky of the original negative with Bluebell or Globe polish to form clouds might answer in some cases, but it would need a very skilled hand and a very artistic eye to produce a result excelling or even equalling the method I have suggested. Where the original negative is thin and the sky grey, some workers proceed to cover the glass side with papier mineral and work the clouds in on this with a stump and blacklead powder. This method has two objections; first, it does not yield results equal to a cloud negative; and, secondly, any experienced eye can at once tell the way the effect (such as it is) has been produced. At the first blush it may seem that the extra cost of a larger negative and copying again is too much; but it must be borne in mind that the extra cost is very small, and the extra time taken in the production of a plate from which, not dozens, but dozens of grosses are to be produced will be well repaid in a very short space of time.

Some publishers there are who opine that a series of a dozen negatives is ample for any moderate-sized town. It is, nevertheless, a fact that with a series of twenty-four or thirty-six the sales all round increase in proportion, and the cost of producing three dozen negatives of one locality, instead of one dozen each of three different ones, is materially reduced. Naturally, there are some towns or villages where not even a dozen selling subjects can be found, and others where the number may exceed a hundred. The operator must perforce use his own discretion, and will no doubt receive valuable assistance in the selection of subjects from some of the prospective customers. A word to the operator: When viewing, do not, for mercy's sake, pop down your camera and photograph your subjects from the first point of view. Rather spend a few minutes, or even half an hour, in inspecting it from every possible point of view, and *then* photograph it from the very best. If the light is wrong at the time, go on to your next subject, and come back to the first when the light is right. Never mind if it is six in the morning or seven at night: the final result will justify the extra trouble and recompense any personal discomfort. When photographing a water subject with reflections, care should be taken to avoid getting the reflection as sharp and clearly defined as the subject reflected. There are too many view photographs about already in which the observer is puzzled as to which is the right way up; remember that the swing back is just as useful to throw one part of the picture slightly *out* of focus as it is to bring the whole of it *in*. In all street views some sign of life should be introduced—tramcars, omnibuses, market carts, tradesmen's vehicles, each of them in turn may suit the subject, and pedestrians and bicyclists are never out of place.

C. Brangwin Barnes.

THE PHOTOGRAPHIC CORRECTION OF NEGATIVES TAKEN OBLIQUELY.

[For the purposes of the French Army Aviation Service, in which he was engaged during the greater part of the war, M. L. P. Clerc has investigated with great thoroughness the mathematical conditions involved in transforming a photograph taken from an inclined aerial camera into one corresponding with that obtained from the same view-point, but with the lens axis vertical. His study has led him to the design of a purely automatic camera carrying out this "redressement." Inasmuch as aerial photographic mapping promises to be an important peace-time application of photography we publish a translation of the text of his paper.—Eds. "B.J."]

1. *Introduction.*—A photograph having been made on a plate not in a horizontal plane, the object of "correction" is most commonly the projection of the negative on to a photographic sensitive surface under conditions such that the sharp image obtained is similar to that which would have been obtained directly on a horizontal plate for the purpose of simplifying map-making work, or even of forming a map by the assemblage of the corrected photographs. The same descriptions of manipulation are plainly applicable to the case of the correction on a vertical plate of panoramic photographs made on an oblique plate for the purpose of the production of a cartographic canvas and of the determination of level, all measurements of azimuthal angles or heights being very much simpler on vertical negatives than on oblique negatives.

The question of correction has been studied for a particular simple case, namely, its application in architectural photography, by C. Welborne Piper, de Romance, and J. Olive, who, by means of different methods of computation, have arrived at the same conclusions.

Corrections of photographic negatives taken from balloons were shown at the International Photographic Exhibition, at Dresden, in 1909, as also the Perspectograph, a correction camera worked out for this purpose by the Austrian army officer Th. Scheimpflug, and which appears to have been used by the German and Austrian armies. Numerous attempts at correction, effected in many cases by empirical methods, were made in the Photographic Sections of the French Army Aerial Service in 1915 and 1916.

2. Let there be considered (fig. 1) a section of the taking camera and of the terrestrial region formed by the principal plane of the lens, the vertical plane containing the optical axis. Let S be the nodal point of emergence of the lens, F the focal length, and P the principal central point of the photograph (foot of the perpendicular let fall from S on the plane of the plate). Let ω be the angle which the axis S P makes with the vertical, V the image of the point "sur-

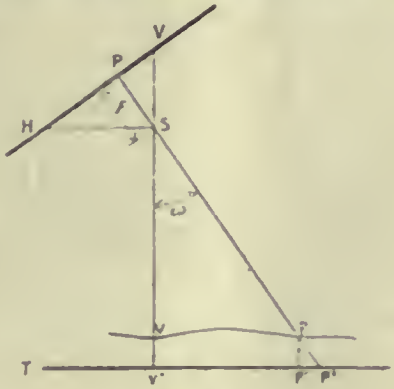


Fig. 1

vole" (i.e., the point in the vertical of which the machine was flying when the photograph was taken), which is also the vanishing point of the verticals, and H the intersection on the plane of the figure of the intersection of the plane of the plate by the horizontal plane containing the view point S. This *horizon line* is the geometric locus of the vanishing points of the parallel straight lines contained in the horizontal plane of the map. In particular, the principal horizon point H, intersection of the line of the horizon by the principal plane, is the vanishing point of straight lines parallel to v' p', the intersection of the plane of the map on the plane of the figure.

A necessary, but not sufficient, condition of correction on a horizontal plate is plainly that, in the new projection, the image of the straight line H is removed to infinity, and that, therefore, the plane P'V' (fig. 2) on which the corrected image is received is parallel to the plane drawn, perpendicularly to the plane of the

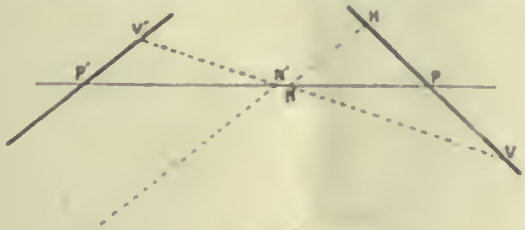


Fig. 2.

figure, through the nodal point of incidence N of the correcting lens and the vanishing line H of the horizontals.

We thus have to discover, in succession, the conditions necessary for the production of a sharp image of a negative presented obliquely to the axis of the correcting lens and for the removal to infinity of the image of the horizon line of the negative. We will then compare the new image with that which would have been obtained by photographing directly from the same view-point S on a horizontal plate, and will discover the conditions, necessary and sufficient, for assuring the similitude of these two images.

After having studied correction in general terms, we will examine the simplifications which can be applied to the operation in certain particular cases; and, lastly, will describe different designs of camera which can be employed for correction.

I.—General Case.

3. *Condition of Sharpness.*—In fig. 3 is shown a lens of focal length f, the principal axis of which is P'P' and the nodal points, N and N'. Let PA be a segment of the straight line, of length l, perpendicular to the axis and P'A' the image of this segment of length l'. Then, calling n the degree of enlargement

$$\frac{P'A'}{PA} = \frac{l'}{l} = n$$

and if p and p' are the distances of the object P and image P' from the corresponding nodal points, by the law of conjugate foci

$$PN = p = \frac{n+1}{n} f \quad [1] \qquad P'N' = p' = (n+1) f \quad [2]$$

Let PA be now brought into PA_1 by turning through an angle α on an axis of rotation drawn perpendicularly to the optical axis at P. The image of A_1 is then formed at a certain point A'_1 and the points a_1 and a'_1, projections of A_1 and A'_1 on the optical axis, are also the images of each other. If p_1 and p'_1 are the respective distances of these points from the corresponding nodal points, we shall have these distances conjugate to each other, i.e.,

$$\frac{1}{p_1} + \frac{1}{p'_1} = \frac{1}{f} \text{ whence } p'_1 = \frac{f p_1}{p_1 - f} \quad [3]$$

From the right-angled triangle PA_1a_1

$$Pa_1 = PA_1 \sin\alpha = l \sin\alpha \qquad A_1a_1 = PA_1 \cos\alpha = l \cos\alpha,$$

whence

$$Na_1 = p_1 = PN - Pa_1 = p - l \sin\alpha \quad [4]$$

and, calling l_1 and l'_1 the lengths of the two segments A_1a_1 and $A'_1a'_1$, images one of the other,

$$A_1a_1 = l_1 = l\cos\alpha \quad [5] \qquad A'_1a'_1 = l'_1 = l_1 \frac{p'_1}{p_1} \ldots\ldots\ldots\ldots [6]$$

Joining $P'A'_1$ and denoting by β the angle $A'P'A'_1 = P'_1 A'_1 a'_1$, we have

$$\tan\beta = \frac{P'a'_1}{A'_1a'_1} = \frac{p'_1 - p'}{l'_1} \ldots\ldots\ldots\ldots\ldots\ldots [7]$$

Eliminating the quantities (lengths) p, p', p_1, p'_1, l, l', and l'_1, from equations [1] to [7] the condition sought can be expressed [2] as

$$\tan\beta = n \tan\alpha \ldots\ldots\ldots\ldots\ldots\ldots [A]$$

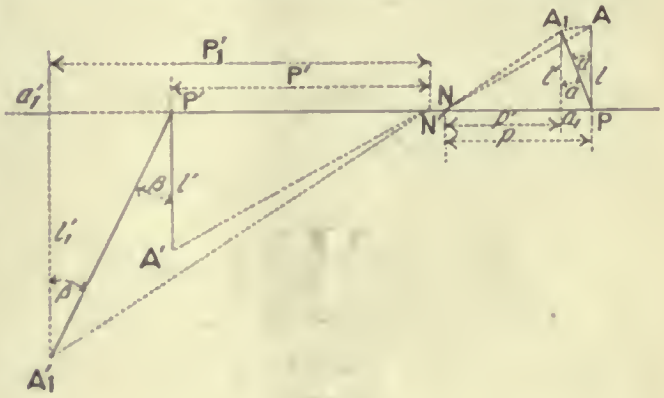


Fig. 3.

This equation, containing only n, the enlargement measured in the optical axis, is thus independent of the position of the point A_1 in the straight line PA_1. The straight line PA'_1, the locus of the images of all the points of PA_1, is thus itself the image of PA_1. Likewise, the plane from PA_1 perpendicularly to the plane NPA_1,

---

1 "British Journal of Photography," vol. 39 (1892), August 28, p. 550, and September 2, p. 565. Bull. Soc. Fr. Phot. (2), vol. 15, No. 2, January 15, 1899, p. 55. Rev. Sciences Phot., vol. 1, March 1906, p. 361.

2 If we replace l'l in (7) by its value obtained from equations (5) and (6) we obtain:

$$\tan\beta = \frac{(p'_1 - p')\, p_1}{p'_1\, l \cos\alpha}$$

and if we also substitute for p'_1 and p' their values obtained from equations (2) and (3) we get:

$$\tan\beta = \frac{1}{l\cos\alpha}\left[\frac{f p_1}{p_1 - f} - (n+1) f\right] p_1 \frac{p_1 - f}{f p_1} = \frac{p_1 - (n+1)(p_1 - f)}{l\cos\alpha}$$

$$= \frac{f(n+1) - n p_1}{l\cos\alpha}$$

Lastly, by substituting for p_1 its value obtained from equations (4) and (1) we get:

$$\tan\beta = \frac{f(n+1) - n p + n l \sin\alpha}{l\cos\alpha} = \frac{f(n+1) - f(n+1) + n l \sin\alpha}{l\cos\alpha}$$

$$= n \frac{\sin\alpha}{\cos\alpha}$$

forms its image in the plane drawn from $P'A'_1$ perpendicularly to the same plane NPA_1.

The condition (A) above can also be expressed in the following form:

Consider any plane Q (fig. 4) oblique to the axis of a lens and cutting this axis in the point P. We will determine the intersec-

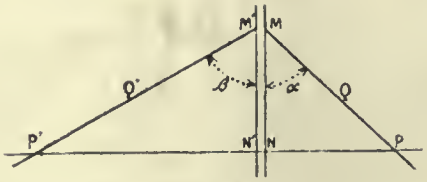


Fig. 4.

tion M_1 of this plane with the corresponding nodal plane N. Through M_1 draw perpendicularly a plane parallel to the axis and cutting the second nodal plane N' along $M'M'_1$, and we thereby determine the image P' of P. The plane Q', conjugate of Q, is thus the plane containing the line M'_1 and P'[3].

As it is easy, in all cases, to pass, by a movement of amplitude equal to the nodal interval N N', from the particular case of a lens having its nodal points together, to the general case of a lens having separate nodal points, we will consider, in what follows, only the case of lenses the nodal points of which come together in the optical centre O. and we shall then be able to state the condition (A) in the form:

Two planes are conjugate one to the other relatively to a given lens if the planes cut the optical axis at two conjugate points, and if, moreover, the intersection of these planes is contained in the plane drawn from the optical centre perpendicularly to the axis [4].

4. *Condition of Removal of Horizon Line to Infinity.*—Assume that the problem has been solved, and consider (fig. 5) a section of the projecting system on a plane containing the optical axis A A'

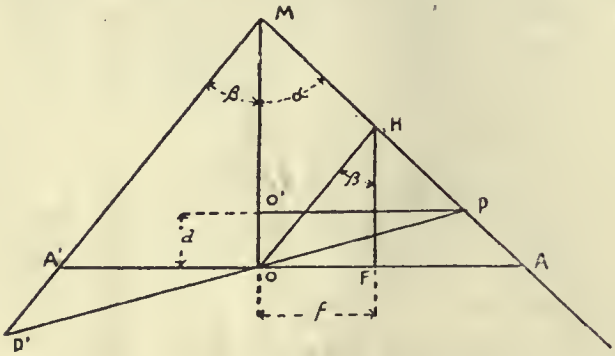


Fig. 5.

of the correcting lens and perpendicular to the straight line of intersection of the planes of the negative and of the corrected image.

In order to determine the condition of removal to infinity of the horizon line H, it needs to be explained that this line is situated in the front focal plane of the lens. Through P, the intersection by the plane of the figure of the horizontal of the negative passing through its principal point, draw a parallel O'P to the optical axis A O to cut the straight line O M in O'. We will denote by d the length of the segment O' O, reckoned positively in the direction M O, and by m the ratio of the focal length f of the correcting camera to that F of the taking camera. Then

$$f = m\,F$$

By similar triangles A F H and A O M

$$\frac{AF}{AH} = \frac{AO}{AM} \qquad [1]$$

$$\text{But } \frac{AO}{AM} = \cos MAO = \sin\alpha$$

$$AH = AP + PH \quad AP = \frac{d}{\cos\alpha} \quad PH = \frac{F}{\tan\omega}$$

$$AF = AO - OF = \frac{f}{n}$$

If their values be now substituted for its quantities, equation [1] above becomes:

$$\frac{\frac{f}{n}}{\frac{d}{\cos\alpha} + \frac{F}{\tan\omega}} = \sin\alpha \text{ i.e. } \frac{d}{\cos\alpha} + \frac{F}{\tan\omega} = \frac{f}{n\sin\alpha} = \frac{m\,F}{n\sin\alpha}$$

$$\text{Therefore } d = F\left[\frac{m}{n\tan\alpha} - \frac{\cos\alpha}{\tan\omega}\right] \qquad [2]$$

The condition (A) of sharpness will be satisfied if the plane of the sensitive plate, on which the corrected image is received, is placed parallel to the plane determined by the horizon line H and the optical centre O[5]. Let the angle F H O be called β. Then

$$\tan\beta = \frac{OF}{FH} = \frac{f}{FH} \quad \tan\alpha = \frac{FA}{FH} = \frac{f}{n\,FH}$$

We shall express from this point the condition [2] above in its final form by making use of the relation

$$\sin\beta = m\sin\omega$$

which is established later [§6]. Substituting "$n\tan\alpha$" by $\tan\beta$ and then respectively $\tan\beta$ and $\tan\omega$ by the ratios

$$\frac{\sin\beta}{\cos\beta} \text{ and } \frac{\sin\omega}{\cos\omega}$$

and lastly $\sin\beta$ by "$m\sin\omega$," we obtain

$$d = F\left[\frac{m}{\tan\beta} - \frac{M\cos\alpha}{\tan\omega}\right] = F\left[\frac{m\cos\beta}{\sin\beta} - \frac{\cos\alpha\cos\omega}{\sin\omega}\right]$$

$$= d = F\,\frac{\cos\beta - \cos\alpha\cos\omega}{\sin\omega} \qquad [B]$$

5. *Study of the Image after Removal of Horizon Line to Infinity.*—The photograph made from the view-point S (fig. 1) on a horizontal plate is similar to the projection $v'P_1$ of the terrestrial area from

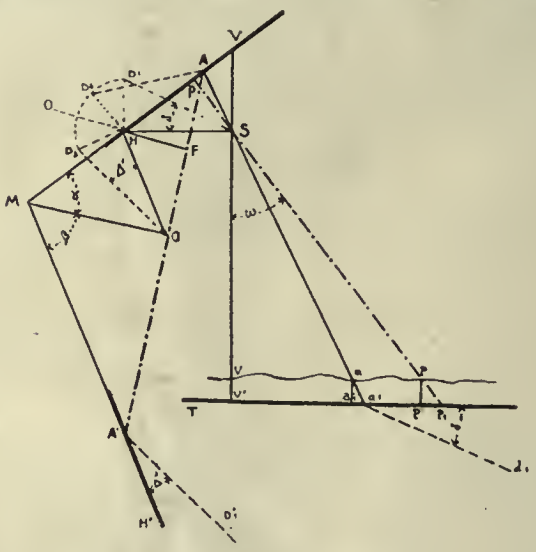


Fig 6.

the centre of projection S on to the horizontal plane T of the map. We will compare the image received on the plane P'M (fig. 5) with this projection, and for greater convenience will combine into one (fig. 6) the two figures (1 and 5) by causing the common elements

[3] If we let fall on the axis a plane perpendicular to the plane Q, to cut the straight lines MM_1 and $M'M'_1$ (Fig. 4), in M and M', then, in the right-angled triangles P M N and P'M'N',

$$PN = MN\tan\alpha \text{ and } P'N' = M'N'\tan\beta$$

and as $MN = M'N'$ and $P'N' = n\,PN$, it follows that

$$\tan\beta = n\tan\alpha.$$

[4] When two plane figures Q and Q' are the projections, one of the other relatively to a projection centre O, the straight line M intersecting the planes Q and Q' is sometimes denoted as the *axis of collineation*; every straight line of one of the figures cuts its image in the other figure along the axis of collineation.

[5] Assuming that two plane figures Q and Q' are one, the projection of the other relatively to the centre of projection O, draw through O the planes R and R' parallel respectively to Q and Q'. These planes are sometimes called the *counter planes* and their intersections with the image planes the *counter axes*. Each of these counter axes is the geometrical locus of the vanishing points of all the straight lines having parallel straight lines as their images in the other plane.

It will be seen that the condition of displacement to infinity of the horizon line H is that the horizon line of the negative to be corrected should be chosen as one of the counter axes of the projection system serving for the correction.

Generally, in any system adjusted to receive the sharp image of a plane oblique to the axis of the projection lens, the counter axes should fall within the corresponding focal planes.

to coincide, the plane of this figure being the principal vertical plane of the taking lens into which we will bring the optical axis O A of the correcting lens, the plane of the figure thus forming a symmetrical plane for the whole system in question.

From S draw a horizontal plane and from O a plane parallel to the plane of the new projection. The intersections of these planes by the plane of the figure are S H and O H. These planes meet along a straight line H D, the intersection of which is H. Let us consider, in the plane T of the map, a straight line a_1d, defined by its angle δ with the intersection of the plane T and, represented by its revolution round a_1d_1, viz., a_1d_1 in the plane of the figure.

In order to determine the image A D of this straight line, produced by the lens S in the plane P M, we will first draw through S a parallel to a_1d. This straight line, contained in the horizontal plane S H D, cuts the plane O H D at a point D of H D defined by its revolution D_1 round S H. The angle H S D_1 being equal, by construction, to H S D, the image of a_1d in the plane of the negative is the straight line A D, the revolution of which, A D_2 round A H, is obtained by joining A to the point D_2 situated on the perpendicular at H to H A at a distance H D_2 = H D_1.

The image of A D projected by the lens O on the plane, drawn by M A′ perpendicularly to the plane of the figure, is a straight line A′ D′. The straight line O D being parallel to the plane of projection, the image D′ of D is displaced to infinity in the direction D O, the revolution D_3 O of which around O H is obtained by setting off on the perpendicular drawn from H to H O a segment H D_3 = H D_2 and joining D_3 O. The straight line A′ D′, parallel to D O, will thus be defined by its revolution the line A′D′, round the intersection M A′ of the plane of the corrected image, the angle H′ A′ D'_1 being equal to the angle H O D_3. Calling this angle Δ' the triangles H S D_1 and H O D, give us respectively:

$$H D_1 = S H \tan \delta. \quad H D_3 = O H \tan \Delta'.$$

Since H D_1 and H D_2 are equal, being both equal to the same segment H D:

$$\tan \Delta' = \frac{S H}{O H} \tan \delta \qquad [1]$$

L. P. CLERC.

(To be continued.)

TONING P.O.P. PROOFS WITHOUT GOLD.

(From Rajar "Trade Notes.")

This month we offer our professional friends a suggestion as regards the toning and fixing of P.O.P. proofs. It is a debatable point as to whether they should be sent out fixed or not, but we are inclined to recommend that they be fixed. So far as we can see, the only reason for sending out unfixed proofs is to defeat the "something for nothing" customer. It is a fact that, in spite of the customary caution sent with unfixed proofs, the sitter invariably exposes them freely to daylight until the images appear flat and foggy. This may militate against a good order; indeed, it often results in dissatisfaction and a request for a re-sitting.

We suggest that the proofs be printed rather deeply and immersed in a combined toning and fixing bath that will give a pleasing warm tone with full gradation but imperfect fixation. A P.O.P. proof treated in the bath given here will retain its colour and brightness for several months, and, as no gold is used, the process is inexpensive.

Lead Toning and Fixing Bath

Acetate of Lead	½ oz.
Hypo	4 oz.
Water	20 oz.

The P.O.P. proofs are printed fairly deeply and immersed direct in the above bath for from 3 to 5 minutes. The colour produced is a rich warm brown, free from yellowness, with pure high lights. A short wash in water completes the process. The used bath can be saved and used over again much in the same way as the hypo-alum bath for toning bromides, and replenished occasionally with new solution. A new bath has a greater reducing action than an old one, and the tones are warmer.

If self-toning paper is used for proofs, this bath gives with our "Autona" paper a very fine brown tone, quite free from double tones or yellowness.

We do not, of course, recommend this toning bath for ordinary work, as the prints gradually undergo a change of colour, and cannot be considered as permanent.

Exhibitions.

BRITISH SCIENTIFIC PRODUCTS.

The exhibition which is being held at the Central Hall, Westminster, until August 5, is a very great advance upon that which was brought together a year ago at King's College and afterwards at Manchester. This year firms are released from the necessity of secrecy which prevented their exhibiting their goods during the period of the war, and the result is that, particularly in the spheres of engineering, chemistry, and electrical appliances, the exhibition is the most striking demonstration of the additions to our industry which the isolation of this country during the past five years has occasioned. The most non-technical visitor is bound to be impressed by the fact that in scores of instances British firms are now making appliances and materials which previously were obtained from the Continent, or in many cases are making something better. The descriptive catalogue, under the editorship of Sir Richard Gregory, chairman of the exhibition organising committee, is a great deal more than a guide to the exhibits. In a series of articles it is a wide survey of the work done during the war and for the war in the industrial and scientific fields by the universities, the importance of which to the industrial community cannot be too strongly emphasised. The catalogue also provides a rapid review of the organisation which has been accomplished for industrial research, in a number of instances by individual firms and in others by trade associations, of which the photographic trade is one. As is pointed out, upon this research the development of the scientific industries which have made so great a beginning amid the distractions of war very greatly depends. We can recommend a perusal of the catalogue to all those who would learn what has already been done, and how much still remains to do, in these developments of manufacture which for the most part are new to this country. The catalogue is issued by the British Science Guild, 199, Piccadilly, London, W.1, price 2s. 6d.

Of exhibitors among the photographic trade there are a considerable number, although the photographic optical firms are represented almost more by non-photographic instruments than by photographic lenses. Messrs. Taylor, Taylor and Hobson are the chief exhibitors of lenses employed in aerial photography, and exhibit a few extremely good military photographs made with the Aviar lens. Messrs. Aldis Bros. show the long-focus lenses specially designed for the photography of Zeebrugge Harbour from a great height. Messrs. Ross, Limited, exhibit specimens of the Airo Xpres lenses of *f*/5.6 and *f*/4.5 aperture, the former one of their later developments during the war for the making of photographs on 18 by 24 c.m. plates. Messrs. R. and J. Beck's exhibit is chiefly devoted to the sights, telescopes, and periscopes, to which their resources were chiefly applied. Messrs. J. H. Dallmeyer, Ltd., show a selection of their optical specialties, and Messrs. W. Watson and Sons, Ltd., exhibit gun-sighting telescopes and prism binoculars. Of the manufacturers of sensitive material, the two exhibitors are Messrs. Ilford, Ltd., and Messrs. Illingworth and Co. The Ilford exhibit, in addition to including spectrograms of sensitol dyes and the firm's new panchromatic plate, makes a prominent feature of the tropical hardening solution recently reviewed in these pages, and contains also some specimens of the orthochromatic visual light-filters recently described by Mr. Renwick in his paper before the R.P.S. Messrs. Illingworth give special prominence to their work in the baryta-coating of raw paper base, to the special papers manufactured by them for the Royal Air Force, to their paper for direct X-ray photography, and to the facilities of their factory in the manufacture of the 54 ins. bromide paper, which has been used for many of the large battle pictures shown in the various war photograph exhibitions. Messrs. Johnsons make a prominent exhibit of the developers, metol, glycin, amidol, pyro, and others manufactured by them, and of their many preparations in the form of compressed tablets and packets for photographic use. The exhibit of Messrs. Johnson, Matthey and Company is of the precious metals and their salts, and of later developments in the manufacture of tungsten, thorium, and other compounds which have lately assumed great importance in British industry. From this brief review, we should not omit to mention the exhibit of the Westminster Engineering Company, of arc lamps for projection and

enlarging, nor that of Messrs. Flatters and Garnett of microscopical apparatus and preparations. Although we have singled out simply the exhibits of photographic firms, the exhibition as a whole is an eloquent tribute to the value of photography, for in the case of a very large proportion of the exhibits use is made of photographs and of photo-micrographs for demonstrating the quality of a product, the character of a machine, or the perfection of a process.

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

The following applications for patents have been received between June 23 and 28 :—

FOCAL-PLANE SHUTTERS. No. 16,000. Focal-plane shutters. E. C. Bass.

FRAMES.—No. 15,738. Photograph frames. E. Green and A. E. Jones.

STEREOSCOPES.—No. 16,261. Stereoscopes. J. M. Hattersley.

CINEMATOGRAPHY.—No. 16,155. Cinematograph studio cameras. W. E. L. Day.

CINEMATOGRAPHY.—No. 16,156. Cinematograph projectors. W. E. L. Day.

CINEMATOGRAPHY.—No. 16,157. Cinematograph apparatus. W. E. L. Day.

CINEMATOGRAPHY.—No. 16,013. Cinematographs. S. Meyer.

CINEMATOGRAPHY.—No. 16,153. Cinematography. H. L. Milner.

CINEMATOGRAPHY.—No.15,954. Cinematograph projectors. T. Royle and W. Whitehead.

COMPLETE SPECIFICATIONS ACCEPTED,

These specifications are obtainable, price 6d. each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

TRANSFER BROMIDE PAPERS.—No. 126,149 (May 7, 1918). The invention is for improvements in manufacturing photographic transfer paper of the character described in the specifications of F. W. Kent and T. P. Middleton's patent No. 12,091 of 1915 (B.J., Oct. 13, 1916, p. 560, and of F. W. Kent's No. 29,616 of 1912 (B.J., Feb. 13, 1914, p. 126); these improvements conducing to better industrial manufacture and to an improved product.

It has been found to be desirable to separate the operations of coating the waxed paper base with substratum and coating with emulsion. The following advantages are thereby secured :—

1. There is no large mass of heated wax at that end of the coating room which it is desirable to keep cool.

2. There are no fumes from the wax and substratum in the closeness of the dark coating room.

3. It is possible to prepare the base so that it shall be ready for coating by other manufacturers without the aid of special machinery.

This is made possible according to the invention by the use of a substratum which on drying leaves deposited grains, in the hereinafter mentioned examples an amorphous powder, bound or tied together by a varnish medium. The powder in the substratum may be in suspension or in solution, or partly in suspension and partly in solution.

To produce the most effective result the resinous substratum or interstratum is a resinous complex in which grains of one resinous constituent stand out in grains in a film of the other resinous constituent, the texture of this complex of two species tending against such strains and stresses in the film as may induce towards self-stripping.

To produce the required resinous complex, the principle of the well-known matt varnish of the photographer is brought into service. Two resinous materials (as sandarac and mastic) are required, also two solvents (as ether and benzene). The action may be by the deposition of one resinous constituent in grains following the evaporation of the more volatile constituent of the mixed solvent; the deposited grains being insoluble in the remaining solvent.

The sandarac being insoluble in benzene, the grains of sandarac are precipitated by the evaporation of the ether, whereas mastic is freely soluble and remains as a varnish.

The use of two resinous constituents does not necessarily involve the use of two commercial resins, as certain commercial resins which are available for the purposes of this invention contain two constituents. It is, however, generally preferred to control the effect by the use of two definite resinous substances.

In general, it is preferred that the original substratum should be a solution or nearly complete solution, as the powder thereby obtained is much finer in the grain and more even than if held merely in suspension.

The solvent must contain two or more components, one of which must be a good solvent for wax, and the other of which should have little or no solvent action; but the former must not be too free a solvent.

In addition, the wax solvent component must be the more volatile of the two. The wax non-solvent component may be a water soluble alcohol, *e.g.*, ethyl or methyl alcohol or a mixture of these, and the wax solvent component may consist of dimethyl, methyl-ethyl, or acetic ethers or their homologues.

In general, such a substratum will contain two solids, both soluble or almost soluble in the mixture of liquids, but one insoluble or nearly so in one of the solvents; so that as drying takes place a resin is precipitated, while another dries as a varnish. Water will often be found to facilitate this action, as some bodies which are soluble in alcohol are not soluble to the same extent in 90 per cent. alcohol.

Occasionally the substratum will appear to only contain one solid, as in the case of gum elemi, one form of which, though completely soluble in ether-alcohol, is only partially so in alcohol; there being two or more constituents.

All must be chosen as have no deleterious action on a sensitive emulsion. Mastic, sandarac, dammar or like gums will, in general, be found to provide the most serviceable substrata.

The proportion of the partially insoluble body to the completely soluble body gives the control over the grain desired; since the grain will be finer as this proportion is made smaller. The grain may be as fine as possible, and the degree may be varied to suit the surface of the paper; thus the grain may be coarser as the paper is smoother, and *vice versa*. In addition, the total amount of solids in the substratum should be no more than is required to secure proper adhesion.

The proportion of solvents present will also have some influence on the grain, but in general these solvents will be chosen to suit the conditions of waxing; and these conditions are dependent upon the nature and porosity of the paper, the temperature at which waxing takes place, and the time the paper remains in the wax. One of the great advantages of this invention is that these conditions are now rendered independent of the coating running speed; and so wider variation is possible in the nature and thickness of the paper; and, if necessary, the temperature of the wax can be near the boiling (or dissociation) point and the time much prolonged; so that very perfect waxing is possible. The ease with which stripping takes place partly depends on the solvents used and the proportions in which the solvents are present; and such a mixture must be selected as will give good facilities for stripping, while avoiding any tendency to "self or automatic" stripping. The more perfect the waxing, the greater must be the affinity of the solvent for the wax.

Care must always be taken that no impurity is present in the solvents which, if left on evaporation, would have a deleterious effect on the subsequent emulsion coating.

The following are examples of possible variations.

A. Sandarac	90 grs.
Mastic	20 grs.
Methylated ether, .720 sp. gr.	3 ozs.
Methylated alcohol, 90 per cent.	3 ozs.

The paper base being a "plain paper" prepared for photo-

graphic purpose, weighing 90 gms. per square metre; the temperature of waxing being 250° F., and the running speed 12 feet per minute.

This gave a very satisfactory product, with easy stripping and no tendency to "automatic" or "self" stripping when the emulsion coating was thin.

B. In another example, where a thinner "plain paper" not prepared for photographic purposes and of very inferior quality was used, being that in use for lining shelves, etc., weight about 75gms. per square metre, temperature of waxing about 220° F., and running speed 10 feet per minute, the waxing being more perfect than in the previous example, the following was used, and gave results comparable to example A.:—

Sandarac	90 grs.
Mastic	20 grs.
Alcohol, 90 per cent.	4½ ozs.
Acetic ether (anhyd.)	1½ ozs.

In this example B the substitution of acetic ether for methylated ether, the former having a greater affinity for the wax, enables perfect adhesion to be realised, notwithstanding the more complete waxing of the paper.

The formula in example B is one which will also serve for the conditions of waxing and class of paper set forth in relation to the formula in example A if the emulsion coating is to be thick and the amount of gelatine present is to be greater.

Wide variation from the above exemplars is allowable, as the pull of the substratum on the wax must be adjusted to the pull of the gelatine layer.

This pull depends,

1. On the thickness of the layer, which, again, depends,

(a) on the amount of gelatine present in the emulsion;

(b) on the method of coating, i.e., whether by dipping, kissing, wiping, or so forth;

(c) the running speed.

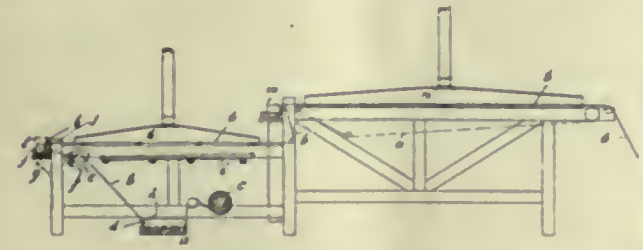
2. On the presence or absence of hygroscopic bodies either added intentionally—*e.g.*, glycerine; or unintentionally—*e.g.*, nitrates left by imperfect washing.

3. On the nature of the original gelatine—*i.e.*, whether hard or soft, and on the amount of chrome or other alum added (if any).

Whether the substratuming and coating operations are carried out separately, as in general is preferred, or are carried out as a continuous operation, as may in some cases be required, some departures from the machine described in the later of the herein above-mentioned specifications are advisable in view of the more volatile nature of the substratum, according to the present invention this increased volatility tending towards undesirable clogging and consequent unevenness in the coating, and trouble in drying.

To avoid these difficulties, and, in general, to promote easy manufacture, the machine illustrated diagrammatically in the accompanying drawings will serve.

In the drawings, *a* designates an electrically-heated waxing dish in which paraffin wax is kept at a temperature of about 250° F. A paraffin wax having a melting point of 132°-134° F. will serve. The paper *b* from a supply roller *c* is led back and



forth more than once through the wax. On leaving the wax the paper passes between doctors or rollers *d*, *d* for removing excess of wax. Thence the paper passes upwards to be buffed or polished by passing between a roller *e* and a polishing buff or brush *f* which revolves at a speed much higher than the surface speed of the paper, a working example being: peripheral speed of the buff, 1,500 to 2,000 feet per minute; surface speed of the paper, 10 to 12 feet per minute. After buffing, the paper passes through a substratuming dish *g*. and then through a horizontal drying trunk or chamber *h*. This trunk *h* is heated, as, for example, with a hot water coil *i*, and air is exhausted therefrom by means of a fan or the like, thus preventing the fumes going out in the room. The substratuming apparatus may also be covered in, and made subject to the exhausting action.

The substratum is applied by two rollers *j*, *j* in contact, that roller dipping in the coating trough running anticlockwise and in contrary sense to the other roller, and the superfluous substratum being, if necessary, removed by means of a wiper *k*, which may consist of two thicknesses of flannel folded round a lath. A weight (or spring) *l* gives the necessary pressure.

All the paper-web bending rollers are driven at the surface running speed. On leaving the drying chamber the paper passes to an ordinary rewinding machine if the substratuming and coating operations are to be carried out separately. Otherwise, as a continuous operation, the paper *b* goes to an emulsion coating device *m* of ordinary type, and, after coating, is carried through a cooling chamber *n* by means of endless tapes *o* running at a speed considerably faster than the surface running speed. Cold air may be blown into the chamber in this case. On emerging from this chamber the paper *b* passes to a suitable looping machine for drying. Kerotype, Limited, 106A, Upper Tooting Road, London, S.W.17, and Thomas Percy Middleton, of 127, Tooting Bec Road, London, S.W.17.

Cinematograph Film Spools.—No. 120,213 (October 21, 1918). The present means of attaching the films to the spools is, when the boss of the spool is made of wood, by placing the end of the film underneath a spring fixed to the boss and when made of metal such as thin tubing, by inserting the end of the film into a slot formed in the boss, then turning the spool round a few revolutions to ensure film gripping, both these means are comparatively slow, there is also a great probability of scratching the film or breaking off the end; the objects of this invention are to provide means for facilitating the mounting of films upon the spools, more especially when renewing the same during operating, by which they may be instantaneously attached to and released from the spools, also to eliminate the risk of damaging the films.

The invention consists in fixing on the wooden boss of a spool a sheet plate provided with two rows of teeth by stamping the same and spaced to correspond with the perforations (usually termed sprocket holes) on each side of the film; or inserting in the boss two rows of pins, screws, nails, or such like to serve as projections for engaging with the perforations on each side of the film.

In spools having a sheet metal boss by fixing on same, by soldering or otherwise, a sheet metal plate as above described or stamping the teeth out of the boss itself.

Arthur Laban, c/o Will's Hotel, Mackay, in the State of Queensland, Commonwealth of Australia.

FORTHCOMING EXHIBITIONS.

September 13 to October 11.—London Salon of Photography. Entries close September 2. Hon. sec., 5a, Pall Mall East, London, S.W.1.

October 13 to November 29.—Royal Photographic Society. Secretary, J. McIntosh, 35, Russell Square, W.C.1.

Enemy Patents and Trade Marks.—The Board of Trade have issued a General Licence authorising the payment of fees in respect of the grant and renewal of patents, and of the registration and renewal of the registration of trade marks and designs in enemy countries or on behalf of enemies.

A Reader from ———don, who on June 11 wrote to Messrs. Hood and Company, Limited, Middlesbrough, but without giving either his name or address, is asked to communicate in a form which permits of a reply. The indication given above of the town from which he writes is all that can be deciphered from the postmark.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

SATURDAY, JULY 12.

Huddersfield Naturalist and Photographic Society. Excursion to Castle Hill.
Chelsea Photographic Society. Outing in Jefferies' country.
South London Photographic Society. Excursion to Bank Side and City.
St. Clements Press Photographic and Rambling Society. Outing to Hampton Court, Esher to Kingston.
Hackney Photographic Society. City Outing.

TUESDAY, JULY 15.

Hackney Photographic Society. "Exposure." J. Linley.

WEDNESDAY, JULY 16.

Tunbridge Wells Amateur Photographic Association. "Colour" Exhibition.
North Middlesex Photographic Society. "Work on the Negative." J. Harbert.

THURSDAY, JULY 17.

Hampshire House Photographic Society. "Hints from Cine Photography." A. H. Page.

CROYDON CAMERA CLUB.

MR. H. GUY JOHNSON gave a capital exposition on "Repoussé Copper Work," one of those non-photographic subjects welcomed in the summer recess.

A comparatively new member, he almost instantly acquired the status of the elect, and by recently presenting the club with a new blackboard, or, rather, "greenboard," which, without squeaking, receives graphic curves and equations, and presents them with great distinctness, he has added materially to the discomfort of many. With the old board, only at certain angles could chalk inscriptions be seen, and what cannot be seen obviously need never be noticed; but now the case is different, and common politeness compels attention, and often a fraudulent aspect of understanding hard to maintain.

His first step after joining the club was to effect important improvements in the paraphernalia connected to the erratic alternating projection arc, which instantly resulted in the fuses blowing. Since then, he has reduced it to abject submission, and, in his hands, it burns steadily with hardly a note of remonstrance. This is a remarkable achievement, and when it is mentioned that the improvements alluded to will effect a saving in current of at least sixpence a year, the value of a practical electrician as a member becomes apparent.

As regards the repoussé work executed by the versatile artist, all that need be said is that he successfully chased some chaste designs, and explained every step in the process, which is hardly one which will appeal to those subject to headaches. Several other members, unasked, also lectured on the art, and gave the principal performer long periods of rest. A most hearty vote of thanks was accorded him.

Talking about repoussé work, brings to mind that the new landlord of the club—the Phœnix Assurance Co.—has recently taken down the outside notice-boards advertising the club, and replaced them by ornamental lettering advertising the company. As compensation, it has dealt with the rent in an opposite direction, and the entrance and staircase leading to its offices, and the club-rooms above, have been converted into things of real nobility—using the word in a modern sense. A refinement consists in fitting swing-doors in close proximity to the front door, which, as usual, opens inwards, and every care must be taken to close the latter before negotiating the former, or there is a decided mix-up. Should a member, closely following, endeavour to re-open the front door before the gentleman inside has cleared the swing-doors (which has occurred more than once), the language that will proceed from within will convey to the last comer that something is seriously wrong, but, possibly nothing beyond. Accordingly, intending visitors might kindly make a mental note that the correct procedure in such a contingency is to restore the front door to the closed position and wait for their turn. To attempt to enter while the concert is on only aggravates the evil.

Commercial & Legal Intelligence.

NEW COMPANIES.

REGINALD E. CARTER, LIMITED.—This private company was registered on June 30, with a capital of £6,000 in £1 shares. Objects: To acquire the business of wholesale dealer in photographers' requirements carried on by R. E. Carter, at 12, Lower Seymour Street, W.1. The subscribers (each with one share) are:—R. E. Carter, 12, Lower Seymour Street, London, dealer in photographic requirements; J. F. Remington, 46, Cherry Street, Birmingham, C. A. Director, R. E. Carter. Solicitors, Gem and Co., 2, Bennetts Hill, Birmingham.

KAPPA WORKS, LIMITED.—This company was registered on June 26, with a capital of £30,000 in 29,990 Ord. shares of £1 each and 200 founders' shares of 1s. each. Objects: Manufacturers of and dealers in photographic sensitive papers, baryted bases, and photographic chemicals, apparatus, and accessories, &c. The subscribers (each with one Ord. share) are:—J. R. N. Rae, Ortania, The Esplanade, Thorpe Bay, Essex; E. G. Todd, 73, Boyne Road, Lee, S.E.13, traveller. First directors to be appointed by the directors. Registered office: 2, Verulam Buildings, E.C.

LENS MANUFACTURERS' SUPPLY CO., LIMITED.—This private company was registered on June 27, with a capital of £3,500 in £1 shares (2,000 Pref.). Object: To carry on the business of optical, surgical, cinematograph, and general engineers, machine-tool and accessory manufacturers, &c., and to enter into an agreement with F. Gibbons and S. Hughes (trading as the "Balham Engineering Co."). The first directors are:—F. Gibbons, 29, Clairview Road, Streatham, S.W.7, engineer; S. G. Hughes, 37, Longbeach Road, S.W.11, insurance broker. Registered office, 10a, Trinity Road, Balham, S.W.17.

News and Notes.

HOUGHTON PRICE REVISIONS.—Messrs. Houghtons, Limited, 88/89, High Holborn, London, W.C., have issued a 24-page pamphlet itemising revisions of prices as compared with the 1914 general catalogue issued by them, as well as with lists subsequently issued. The pamphlet also indicates goods which have been withdrawn.

PERMANENT CINEMATOGRAPH FILM COLLECTIONS.—In the "Times" of Wednesday last, July 9, Mr. Herbert G. Ponting writes in contradiction of the view recently expressed by a writer on cinema topics in the "Times" to the effect that an obstacle in the way of preserving motion picture records is that of preserving the films themselves in good condition. Mr. Ponting instances, in support of his contention, the Scott Antarctic films, which underwent two journeys through the tropics, once before development and afterwards on their return, in addition to experiencing low degrees of temperatures down to 50 or 60 below zero Fahrenheit. This was in 1910, and Mr. Ponting mentions that these films, although subjected to the severest of tests, yield positives which for brilliance and quality are indistinguishable from those made immediately on his return from the expedition. He is prepared to take the view that film negatives properly treated with glycerine and hermetically sealed should last for at least 100 years.

A BUTCHER-WILLIAMSON CINEMATOGRAPH ARRANGEMENT.—Messrs. W. Butcher and Sons, Limited, have completed an arrangement with the Williamson Kinematograph Company, Limited, by which they have secured the sole distributing rights throughout the world for the manufactures of the latter firm. Messrs Butcher, moreover, have taken a financial interest in the Williamson Kinematograph Company, and Mr. W. F. Butcher has joined the directorate of the Williamson firm. The arrangement is one which allows Mr. Colin Williamson, well known as a mechanician and designer of all descriptions of cinematograph appliances, to devote himself exclusively to the manufacturing side of the business. Messrs. Butcher have purchased the lease of the Williamson Company's premises at 28, Denmark Street, London, W.C., and will employ them as their West End branch as soon as the necessary equip-

ment in the shape of showroom, projection demonstration theatre, stores, and repair shop has been completed. The branch will be under the management of Mr. N. E. Barber, for some years Mr. Williamson's assistant manager. A combined catalogue of the principal manufactures of the Williamson company and of Messrs. Butcher is in the press, and will be ready for distribution to the cinematograph trade very shortly.

A Speaight Garden Party.—The employees of Messrs Speaight, Limited, were entertained at a garden party given by Mr. and Mrs. Richard Speaight, at their beautiful home at Beaconsfield, Buckinghamshire, on Saturday last, July 5. A programme of sports, in which a one-legged New Zealand soldier distinguished himself, entertained the company during the early part of the afternoon. Messrs. Speaight had invited also a few Colonial soldiers, who, owing to the loss of limbs, were unable to carry on their pre-war employments. After tea, to which nearly sixty sat down, Mr. Richard Speaight heartily thanked the staff for the splendid services which they had rendered during the war. The firm was proud of the fact that every male member of military age had offered himself for active service when the Government asked for volunteers in 1915. They regretted that two of them had been killed; others they were glad to welcome back in their old places, and the firm could not sufficiently thank those who had carried on its work during the past difficult years. Mr. Speaight welcomed the presence in the party of some heads and representatives of photographic firms, and expressed his appreciation of the help and courtesy which his firm had received from them during the period of the war. Mr. Gerald Bishop, of Messrs. Marion and Co., in responding, expressed his pleasure at being present. His firm, he said, could speak of friendly relations with that of Messrs. Speaight for twenty-five years. Mr. Cullun, of the Kodak Company, referred to a similarly cordial relationship between his own firm and that of Mr. Speaight. An impromptu concert, given by members of the staff, greatly contributed to the enjoyment of the day, and the proceedings ended with a vote of thanks to Mr. Russell Seller for his arrangement of the sports and for his own clever conjuring and thought-reading entertainment. A train in the late evening bore the party back again to London, after a supremely pleasant day.

Correspondence.

**** Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

**** We do not undertake responsibility for the opinions expressed by our correspondents.*

A PROFESSIONAL PHOTOGRAPHIC ASSISTANTS' ASSOCIATION.

To the Editors.

Gentlemen,—*Re* the formation of a Professional Photographic Assistants' Association, in the report ("B.J.," of June 27) of the meeting of the P.P.A., I note that it was suggested, and the committee approved of such, and it was carried that they would give financial assistance to the sum of £10. As an assistant of many years' experience, I think it was the only and by far the wisest course to take. I should like to thank the committee for the great interest they have taken in the question.

It now remains to be seen if the assistants have any real interest in the profession, for if such an association comes to life, it cannot fail to be of great benefit to us and the profession as a whole. I feel the time has now arrived to make a start in this direction, and would like to suggest that any assistant interested in its formation who can attend a meeting in London (at a date to be decided) to enable a committee to be formed, to frame rules, programme, &c., would kindly communicate with me at the very earliest. I will at once do my best to arrange such a meeting. Now, assistants, it is for us to act, and *act* at *once*.—Yours truly,

A Hamilton Smith,

64, Marine Parade, Hythe, Kent

Answers to Correspondents.

SPECIAL NOTICE.

In consequence of general reduced supplies of paper, as the result of prohibition of the importation of much wood pulp and grass, a smaller space will be available until further notice for replies to correspondents.

Moreover, we will answer by post if stamped and addressed envelope is enclosed for reply: 5-cent. International Coupon, from readers abroad.

The full questions and answers will be printed only in the case of inquiries of general interest.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

R. F. O.—The Defence of the Realm Order dealing with photography out of doors has been repealed since the armistice was signed, so that you may use your camera as freely as before the war.

E. C. D.—The negative sent appears to have partly melted on the surface; we have seen several such cases during the recent hot spell. The foggy appearance is probably also due to the same cause. The only preventive is to cool the developer by means of ice.

G. C. H.—Almost any lens which will give good definition will answer for outdoor portrait photography. A rapid rectilinear is perhaps the most suitable, but whatever kind is chosen, it should not be of too short focus. Ten inches is a good length for half-plates.

H. A.—If your friend ordered and paid the usual charges for the photograph, then the copyright belongs to him; he can give you permission to make enlargements from it if he wishes, and there is nothing to prevent him from exhibiting the enlargements in his window.

H. J.—Waste sodas or hypo are of no value as fertilisers. The best suggestion we can make is that you keep the waste carbonate as a substitute for washing soda for domestic purposes, whilst the hypo and sulphite may be used as deodorisers—for example, in flushing sinks, &c.

F. M.—You can get backing colour ready prepared from any large dealer in photographic materials. It has simply to be spread on the back of the plate, either with a soft brush or a pad of flannel. Do not remove it until the plate is nearly developed, or you will probably spoil the film.

A. S. B.—So long as you confine your business to wholesale trading there is no need for a licence. The Order applies only to retail businesses, and, in the case of photography, at present includes only those businesses where frames or other accessories are sold. No charge is made for a licence in any case.

W. E. R.—The stigmatic will answer well for practically any class of work, but 7½ ins. is rather short for half-plate groups, unless they are a good distance from the camera. If they are close up, such as a small wedding group of six or eight figures, the front ones will be rather too large in proportion to the back ones.

W. S.—The direct-vision finder can be fixed in a minute or two by the aid of two screws. The usual angle embraced is about that for the 5¾ ins. lens on a ¼-plate, but by putting the eye a little nearer it would probably do for the 4¾ ins. as well. You can get such finders from any of the large photographic dealers.

C. D.—The Autotype Company, 74, New Oxford Street, London, W., make a photogravure tissue which acts as a resist, and they will send you all particulars as to its use. For relief blocks, bichromated fish-glue is used as a resist. Asphaltum is rarely used nowadays. Block-making requires much skill, and the apparatus is rather costly.

F. O. C.—Just now there seems to be no uniform system of marking retouching leads. Some makers do not mark them at all, but will supply them in various grades corresponding to the old numbers, which were No. 2, soft, No. 3, medium, and No. 4, hard. Others mark them with the ordinary HH to BB, like the cedar pencils; of these, HF and HB are the most useful.

T. C. P.—You are using altogether too much light. In addition to the white blinds you want a set of dark ones with which you can stop out all light from the greater part of the roof and side. Also, the interior of a studio which faces the sun should never be painted a light colour; a medium grey or sage green would greatly help to do away with the flat effect.

C. H.—The proportions of the fixing-hardening bath seem about right. Probably the tendency of the bath to deposit a sludge is caused by a wrong method of mixing the chemicals. You should dissolve the alum and sulphite in separate solutions. Cool these if you have used hot water, and then add weak acetic acid to the sulphite, then add the alum solution to the mixture. When this mixture has been made it is then added to the hypo solution.

G. W.—We doubt if the performance of the lens is wholly due to deterioration of the surface, but, at any rate, such deterioration, if really marked, will account for a great deal. It all depends on the condition of the surface whether re-polishing can be done. Re-balsaming, of course, is simple enough, and an optician could say at once whether that would effect any remedy. Usually it is difficult to get the standard lens makers to do repairs of this kind.

D.F.—Three 1,000 c.p. lamps of the ordinary half-watt pattern should give you sufficient light; each of these should have a white reflector behind it, and a *thin* calico diffuser in front. The lamps should be placed about 8 ft. from the ground for standing figures, but should be able to be lowered to 6 ft. for sitting figures and children. This will greatly shorten the exposure; in fact, halve it. The walls should be a light colour, but not white, as this tends to flatness.

A. A.—1. Any assistants who come in contact with customers are within the scope of the Shops Act, and can demand the weekly half-holiday, whilst the fact of their being engaged in the place makes the half-day closing compulsory unless relief is obtained from the local authority. You should apply to your municipal authority, town council, or district council, for particulars. 2. Messrs. Hood and Co., Sanbride Works, Middlesbrough, can supply calendars of the kind you mention.

T. W.—An enlarger is designated by the largest size which the condenser will cover—for example, a 5½-in. condenser will only illuminate a quarter-plate, and a 8½-in. condenser a half-plate. You can enlarge from any smaller plate than these; thus a half-plate enlarger will take all the smaller sizes you mention. As an example, we have recently been enlarging 1 in. by ¾ in. in a whole-plate enlarger. The size of the enlargement is limited only by the strength of the light you employ.

F. A. C.—1. We think that you will get very little colour correction by using the sample of glass sent. If you want a cheap and good screen, get a piece of K2 gelatine film from Kodak and place it between your lenses. No glass will then be necessary. The regular ortho plates should be used; ordinary plates gain practically nothing from the use of a screen. 2. The commercial red and green glasses vary so much in quality that no comparison is possible. The Wratten safe-light No. 2 will be the safest investment.

J. R.—The Morrison lens, of which you send sketch, is certainly not of the rectilinear form, but some early type of doublet which we cannot identify. It is very difficult to say anything about these old lenses, as very often the original glasses have been replaced by some later by way of experiment. The lens in no way resembles the Dallmeyer D lenses, which are of exactly the same construction as their patent portrait lenses. We believe Dallmeyer made a few rapid triplets which he called D group lenses before the patent of 1866 was taken out.

A.L.—There are no books on professional portraiture with the exception of such special small manuals as "The Portrait Studio," "Commercial Photography," and "Sketch Portraiture." The best general text-book of principles and practice is the "Science and Practice of Photography," by Chapman Jones, at present out of print, but no doubt obtainable from Messrs. Foyle, 121/123, Charing Cross Road, London, W.C.2. An alternative is "Photography and Its Applications," by Alfred Watkins, the second edition of which has just been published by Messrs. Constable, 10, Orange Street, Leicester Square, price 10s. 6d.

C. B.—The safe-light corresponding with the degree of illumination referred to in the article which you quote is one such as the Series O of the Wratten Division of Messrs. Kodak, Limited, Kingsway, London, W.C.2. This is a very bright light for the handling of rapid plates; but with care in shielding the plate and in keeping it covered during the earlier stages of development, it is quite possible to use it, though in inexperienced hands it would be pretty certain to produce fog. A somewhat darker safe-light is the Wratten Series I. You can buy these safe-lights in sizes 7 ins. by 5 ins. to 20 ins. by 16 ins., and they can quite well be used in a lamp fitted with incandescent gas, unless the construction of the lamp makes the heat altogether excessive.

Fixed-Focus Enlarger.—1. I am making a fixed-focus box enlarger for ¼-pl. to 1-1-pl., according to the formulæ on page 401 of your 1919 Almanac. I have a lens from an eye microscope of about 2 15-16 focus. Will it serve for the purpose, and to what size aperture should it be stopped down? 2. The water here, being used only for washing, is pumped from the river (in the country above York), and is often of a dirty colour from the mud brought down; there is no pollution from factories near here. Is this water suitable for the ordinary purposes of development of plates and papers? If not, can you suggest a remedy?—R. R.

1. If you focus your image with the full aperture of the lens and then fix a stop of about f/45, you will find no real loss of definition on account of the lens not being corrected for chromatic error. 2. Unless there is an appreciable amount of iron in the water there will be no danger in using it. Tie two thicknesses of flannel over the tap to filter out the mud. Swab your plates and paper after washing.

The British Journal of Photography.

Line Advertisements.

Charges for Insertion.

Since advertisements cannot be inserted until fully and correctly prepaid, senders of line announcements are asked to bear in mind the scale of charges. They will thus save themselves delay in the publication of their announcements. A Schedule by which an advertisement can be correctly priced will be sent on request.

Net Prepaid Line Advertisements.

12 words or less 1/-
Extra words ... ... 1d. per word.
(No reduction for a series.)

Special Note. Box Number Advertisements.

"Box No." and office address ... ... charged as 6 words.
For forwarding replies add ... 6d. per insertion for each adv't.
If replies are called for this latter charge is not made.

Advertisements cannot be inserted until fully and correctly prepaid.

Orders to repeat an advertisement must be accompanied by the advertisement as previously printed.

Advertisements are not accepted over the telephone or by telegram.

The latest time for receiving small line advertisements is 12 o'clock (noon) on Wednesdays for the current week's issue.

Displayed Adv'ts should reach the Publishers on Monday morning.

The insertion of an Advertisement in any definite issue cannot be guaranteed.

HENRY GREENWOOD & CO., Ltd., Publishers,
24, Wellington Street, Strand, LONDON, W.C. 2.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3089. Vol. LXVI. FRIDAY, JULY 18, 1919. Price Twopence.

Contents.

	Page
Ex-Cathedra	405
Stereoscopic Photography	406
Forthcoming Exhibitions	407
Practicus in the Studio. By Practicus	408
How to Prepare Photographic Solutions. By J. I. Crabtree	410
The Photographic Correction of Negatives Taken Obliquely. By L. P. Clerc	411
A Copyright Infringement Case	414
Photo-Mechanical Notes	416
Patent News	417
Catalogues and Trade Notices	418
Meetings of Societies	418
Correspondence—	
Perchloride of Iron for Making Rapid Photo-Transfers from Tracings—Dry-Mounting with a Copying Press—Reversal in Development—A Professional Photographic Assistants' Association	419
Commercial and Legal Intelligence	419
Answers to Correspondents	420

SUMMARY.

In the last of the series of leading articles on stereoscopic photography the writer deals with a by-path, not strictly photographic, but possessing great scientific interest and providing the opportunity for the making of very interesting hand-produced stereograms. (P. 406.)

In the concluding instalment of the paper on the making up of photographic solutions Mr. J. I. Crabtree deals with the purity of water, with common impurities in developing and fixing chemicals, and with the storage of chemicals. (P. 410.)

In his article this week "Practicus" deals with the carrying out of such simple repairs and renovation of studio apparatus as come easily within the competency of the photographer. He itemises the outfit which is of service and gives working instructions for carrying out the jobs most frequently required. (P. 408.)

The mathematical conditions for the correction of an aerial negative taken with the axis of the lens at an angle from the vertical have been worked out very fully by M. L. P. Clerc, with the object of providing a rapid means for making from such negatives reproductions representing the results obtained from the same view-point with a vertical lens-axis. (P. 411.)

An interesting case of reversal by the production of dichroic fog on under-exposed plates forced in development is brought to our notice by the Ilford Company. (P. 419.)

The apprenticeship question prompted a lengthy discussion at the Edinburgh Society of Professional Photographers. (P. 418.)

Judgment in the Dublin Chancery Division was given last week in a case of infringement of copyright in photographs. The owner of the copyright obtained an injunction restraining further sales of the photograph. (P. 414.)

The Photographic Convention held its first meeting since the outbreak of war at Oxford last week under the presidency of Mr. G. W. Atkin. (P. 415.)

Rotary gravure, printing on the metal, retouching in photo-litho, and the use of film in process work are among the topics of "Photo-Mechanical Notes." (P. 416.)

The design of a focussing finder of the camera pattern appears under "Patent News." (P. 417.)

Much hypo is wasted by removing prints from the fixing bath without draining. In the course of a day's work a fixing bath may become greatly weakened by addition of developer and removal of hypo, although the fact may escape notice owing to the bulk of the fixer remaining the same. (P. 405.)

Apropos the recommendation of a long-focus lens for good perspective, such a lens is after all only a means of taking the more distant standpoint, which is the decisive factor. (P. 405.)

EX CATHEDRA.

False Perspective. Apropos of our recent note on exaggerated perspective in so many commercial photographs, and the recommendation to use a long-focus lens, it must not be taken that the fact of not having a long focus lens is any excuse for this distortion. Perspective is due to the angle of view, and the angle of view depends on the distance from which any object of a given size is viewed. From any particular position with a long-focus lens you get a larger image than with a shorter focus lens. But whatever the focal length of the lens the photographer should select the point of view that gives a suitable perspective and then photograph. If the image obtained is too small it is almost as easy to make an enlargement as to make a contact print. Of course, we do not ignore the fact that sometimes it is impossible for the photographer to get far enough away from the object, and in that case there is no help for it except to permit some distortion, though if an enlargement is permissible, so that the spectator is compelled to stand in about the same relation to the picture that the camera was to the object, the apparent distortion will not be present.

* * *

Economy in Fixing. The price of hypo is still many times that of pre-war times, and various expedients for economising in its use have been suggested. There is one, however, that most people seem to have overlooked, and that is not to pour it down the sink needlessly. We are all apt to work our fixing baths pretty well to the finish, but a good deal of the hypo is wasted before it has done much work. The way in which this occurs is a very simple one—it consists merely of carrying over an excess of the solution into the first washing water. If we watch the ordinary operator we shall find him lifting his negatives and prints in one movement from the hypo to the washing tank or tray, the hypo running in a stream the while. This is especially the case with bromide prints and enlargements, which are often lifted in a mass carrying with them a large quantity of the fixer. If these were lifted separately and drawn over the edge of the dish little would be carried over, and the first washing would be more effective. The loss is often not noticed because the bulk of the fixing bath is kept up by the water which is carried into it by the prints and plates after the developer has been rinsed off. That this is so can be proved by the disappearance of the developing solution. If a man uses up 40 ounces of developer in a day and does not rinse his prints, and many do not, it must have gone somewhere, and there is nowhere for it to go but into the hypo. A fixing bath with 40 ounces of its bulk abstracted and replaced by developer is certainly not in proper condition,

and it is not to be wondered at that the whites of prints "fixed" in it discolour sooner or later.

* * *

Blackening Slides — A caution. Of the various compounds recommended for blackening the inside of dark-slides, etc., finely ground lamp-black mixed with methylated spirits and a sufficiency of orange shellac to just bind the pigment without imparting a gloss has been considered one of the best and safest to use. A recent experience of a professional photographer, however, points to the necessity of only employing good quality spirit. Some book-form dark-slides were sent by him to a photographic firm to be re-blacked inside, and on their return it was found that plates were fogged all over, even if only allowed to remain in them overnight. Enquiring from those responsible for the job brought an answer that the usual methylated spirits and shellac mixture had been used, and it was suggested that the cause of the trouble was probably due to some new constituent, in the nature of a gum substitute, which had been introduced into the spirit. Certainly much of the spirit lately sold as "methylated" has been wretched looking stuff, and the explanation offered may well be the correct one. A close nasal test applied to the blacking indicated turpentine had not been employed, the fogging propensities of which are well-known.

* * *

Stock-keeping. Perhaps in a less degree than formerly, but still to a considerable extent, photographers lose money by allowing various articles such as mounts, frames, cases and rims for miniatures, to deteriorate upon the shelves after the first demand has died away. For this reason it is advisable to be very cautious in purchasing, and not to lay in a large stock of anything but standard patterns for which a steady demand is certain. Having the stock on hand, however, the vital consideration is to shift it, so that instead of gradually becoming lumber it is turned into cash, which can work for the business. Every few months it is desirable to look over the stock, and if any one line does not move to clear it out for what it will fetch. For example, there may be half-a-dozen frames of a size and style which do not go with any current work, or an accumulation of mounting papers of tints which no one will now look at. These can usually be sold to a picture-frame maker at a cheap rate, especially just now when stock of all kinds is scarce. With regard to mounts the question is more difficult, as most of these will bear a printed or embossed name and address. It will be economical in many cases to cut up large mounts into smaller sizes, or, where only the edges are soiled, to have them put through the guillotine to freshen them up. If this cannot be done, such old mounts should be passed on to the packer or sent to the mills to be pulped again anything being better than allowing them to occupy space and accumulate dust, without any prospect of their ever being utilised.

STEREOSCOPIC PHOTOGRAPHY.

V.—Some Scientific Applications.

Quite apart from the æsthetic value of the stereogram is its scientific and intellectual usefulness as a method of instruction. So convincingly real is the illusion of stereoscopic vision that a series of stereograms can practically take the place of solid models in many departments of scientific instruction where such aids to comprehension are required.

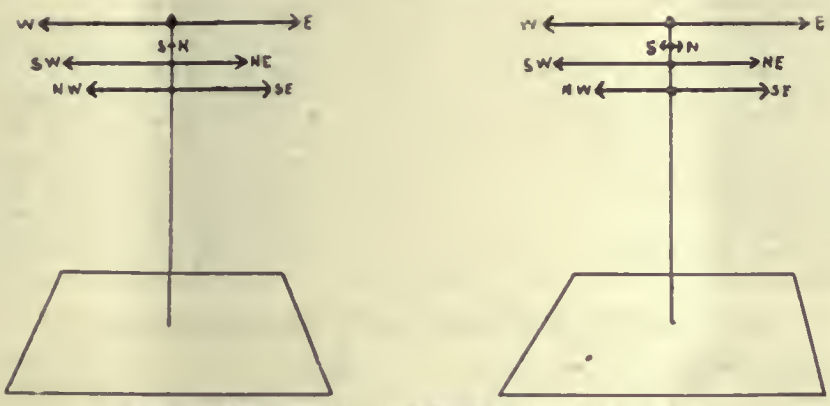
Almost every object in a museum could be stereoscopically reproduced so as to give nearly as vivid an impression as the object itself. Indeed, the stereogram may in one respect perhaps excel the displayed collection, for while this latter cannot always be lighted to perfection in every part at all times the photographic reproductions may each be prepared under the best lighting conditions, the objects being placed before the camera in the exact positions that will best show the special characteristics of interest. If added to this the knack of seeing stereoscopically without an instrument (already referred to) is acquired an album or cabinet of stereograms might be a veritable museum in itself. In the study of natural history, stereograms are especially helpful. Living organisms and plant forms, small and large, can all be displayed to the life, and nothing but colour is wanting to make the model for all practical purposes as helpful for study as a glimpse of the natural object.

Allusion has already been made to the importance of astronomical stereograms, and to the one or two examples adduced may be added the suggestion that the wonderful models of lunar craters made by Nasmyth and still preserved might advantageously be photographed with the stereoscopic camera pro bono publico. Probably many people who see in text-books of astronomy the superb photographic reproductions of the lunar surface with its craters have never questioned the illustrations as being other than actual lunar photographs. It is disappointing to have to point out that this is not the case, but that these familiar and extensively printed lunar views are generally copies of photographs of Nasmyth's models illuminated by strong sunlight so as to give the correct shadow effects. At the same time the models are so extremely skilfully made that they are well worthy of stereoscopic reproduction.

A stereogram drawn by the twin elliptic pendulum. By C. E. B.

The application of the stereogram for scientific purposes extends also to photographs of 3-dimensional vibrations and other interesting phenomena in physics. An enormous field is open in the production of hand-drawn stereograms to illustrate such scientific subjects as require either 3-dimensional drawings or solid models. Here we are, perhaps, getting away from photography, but not altogether. So accurate must the perspective drawings be for these diagrams that it is greatly preferable to execute them on a large scale and then reproduce them photographically, diminished to the proper size for the stereoscope: or the wire models made for the physical laboratory to illustrate such subjects as polarisation of light and crystallography may be photographed direct with the stereoscopic camera.

Hand-drawn diagrams, however, afford more scope than these photographs of wirework constructions, and will enable stereograms to be made exhibiting many important principles which it would be impracticable to imitate by means of solid models. Among these subjects may be mentioned the more intricate forms required to illustrate crystallography, the numerous diagrams needed to expound the principles of polarisation and the theory of perspective. Descartes' theory of the rainbow can be exquisitely rendered in colour as a stereogram, and is one of the easiest subjects to draw. The law of inverse squares is also much clearer in the stereographic than in the ordinary diagram, and many other examples might be given in physics of subjects lending themselves to stereoscopic representation. It hardly need be explained that in drawing stereoscopically all that has to be attended to is the perspective, and consequently subjects should be chosen which consist of ruled lines rather than freehand curves. One drawing having been executed with a given vanishing point, a second is made at a horizontal distance of $2\frac{1}{2}$ inches, and with the vanishing point shifted in the same direction about $2\frac{3}{4}$ inches. This will ensure that the two drawings shall vary in separation distance between the limits of $2\frac{1}{2}$ inches and $2\frac{3}{4}$ inches, as specified in a previous chapter. The "measuring off" in the second drawing is automatically performed by means of horizontal lines from determining points of the first drawing. This having been done on a large scale (multiplying the $2\frac{1}{2}$ and $2\frac{3}{4}$, say, by two or by three), the pair of drawings can be copied photographically one-half or one-third their width, and a very perfect stereogram results. Drawing direct without diminution takes a good deal of practice, as extreme exactness is essential, and under the enlarging lenses of the stereoscope is apt to reveal imperfection.



The Paradoxical Weather-vanes, a hand-drawn stereogram. By C. E. B.

In conclusion, it may be amusing to give one of the curiosities of hand-drawn stereograms—a number of weather vanes which all lie apparently horizontal and parallel, but profess to turn to all points of the compass. The stereoscope shows that their claim is justified, the explanation of the apparent paradox being that they are all drawn at practically the eye level, so that their tilt is only represented by a foreshortening. The foreshortening varies in the perspective of the left and right pictures, and a combination of the images gives by association of ideas the true direction of the arrows. An example is also reproduced of the extraordinary effects obtained by stereoscopic curve tracery executed with the twin elliptic pendulum. The method employed was described in "Knowledge," February, 1914, and it will be seen that here we have presentments of realistic-looking solid curve-forms which never had any actuality, and are never likely to have.

C. E. B.

FORTHCOMING EXHIBITIONS.

September 13 to October 11.—London Salon of Photography. Entries close September 2. Hon. sec., 5a, Pall Mall East, London, S.W.1.

October 13 to November 29.—Royal Photographic Society. Secretary, J. McIntosh, 35, Russell Square, W.C.1.

A Folkestone Studio Outing.—A very successful holiday excursion was undertaken by the staff of Mr. Halkesworth Wheeler, Folkestone, on Wednesday in last week, July 12. In company with Mr. Wheeler, his wife, and daughter, a long day was spent by the staff in a motor drive through some of the most picturesque parts of Kent. Travelling through Tenterden and Cranbrooke, they reached Maidstone for lunch, when Mr. Wheeler took the opportunity of expressing his pleasure at having his assistants again with him after their service in the Army. He looked forward to their prospering together in the business, and the good relationship which existed between them encouraged him to believe in pleasant and profitable years before them. Continuing their motor drive through Wrotham and Cobham, to Rochester, tea at the latter place was made the occasion of a presentation to Mr. Wheeler by his staff of a silver card-case as a token of good will. The return journey to Folkestone was made in the beautiful weather which had prevailed during the whole day, and at 10.30 the party dispersed, after a thoroughly enjoyed excursion.

PRACTICUS IN THE STUDIO.

[Previous articles of this series, in which the aim of the writer is to communicate items of a long experience in studio portraiture, have appeared weekly since the beginning of the present year. It is not thought possible to continue the series to the length of that by the same writer which ran through the "British Journal" some years ago, but if any reader among the younger generation of photographers, and particularly those engaged as assistants, has a particular subject which might be dealt with, his or her suggestion will be welcomed. The subjects of the previous articles of the series have been as follows:—

A Talk About Lighting (Jan. 3).
The Camera and the Lens (Jan. 10).
Managing the Sitter (Jan. 17).
Backgrounds (Jan. 24).
Studio Exposures (Jan. 31).
Artificial Lighting (Feb. 7).
Printing Processes for Portraiture (Feb. 14).
Studio Accessories and Furniture (Feb. 21).
The Surroundings of the Studio (Feb. 28).
Studio Heating and Ventilation (March 7).
The Postcard Studio (March 14).
The Printing-Room (March 21).
About the Reception Room (March 28).
Home Portraiture (April 4).
Portable Studios (April 11).
Copying (April 18).
Handling the Studio Camera (April 25).
More About Lenses (May 2).
Enlargements (May 9).
Advertising the Studio (May 16).
Mounts and Mounting (May 23).
Business Methods (May 30).
Photographing Children (June 6).
Portraits of Elderly People (June 13).
Something about Lenses (June 20).
Hand Cameras for Professionals (June 27).
The Dark-Room and Its Fittings (July 4).
Plates and Their Work (July 11).

APPARATUS REPAIRS AND RENOVATIONS.

Just now it is not easy to get even the simplest camera repairs done quickly, while the cost, like most other things, is nearly double what it used to be. It is therefore highly desirable that the photographer should be able to help himself when he has a mishap or any part of his apparatus gives out through wear.

Before starting it is very desirable to obtain a few tools, as it is very easy to do more harm than good by trying to make shift with unsuitable appliances. Most of the tools needed are small, and the quality usually supplied to fretworkers will answer very well, besides being less costly than those made for cabinetmakers. I would suggest the following as a start: Two screwdrivers, one of fair size with, say, a 9-inch blade, and one quite small one for flange screws and fixing small hinges. It should be noted that a screwdriver—or, as it is more correctly called, a turnscrew—should not have a sharp edge like a chisel, but should be square at the end so that it fits well into the bottom of the cut on the head of the screw. This is to prevent it jumping out, damaging the screw and perhaps scratching the woodwork. A large bradawl makes a very good small screwdriver if the end is properly shaped, and costs much less than the proper article. Next we want a couple of bradawls, medium and small sizes, the latter being square in section and tapering to a sharp point. This pattern is much better for hard woods, such as mahogany and walnut, as it may be used as a drill, and any risk of splitting avoided. A small Archimedian drill is very useful, as it may be used for metal as well as wood. A quarter-inch chisel, a small hammer and two or three small files will also be necessary, and if the expense be not objected to a small tenon saw and one of the little American steel planes may be added. Although not to be classed as tools, two or three sheets of fine glass-paper will be found almost indispensable, as is also a tube of Seccotine or Le Page's fish glue. For large work and fixing bellows ordinary glue is best, and an efficient glue-pot may be improvised from a jam-pot and a small saucepan; it is desirable to put one or two small pieces of broken glass or china in the saucepan first to allow the hot water to circulate freely under the jam-pot. Screws and nails of suitable size must, of course, be procured as needed, and no risks in using those of too large or too small a size should be taken. It is impossible to deal with my subject in anything like a systematic way, as no two instruments will require exactly the same repairs, so that I will deal with some of the defects most commonly met with.

Looseness of the rack and pinion adjustment, which allows the camera back to move when the slide is inserted or when the bellows is fully extended is usually easily remedied. All that is necessary is to take out the screws which fix the rack to the baseboard and to pack up underneath with strips of brown paper, placed where the loose places were. If the whole length is packed up it may cause some places to fit too tightly. Care must be taken that the screws when replaced have a good hold. If the thickness of the paper prevents this, slightly longer screws must be fitted, or the holes may be plugged with a small peg of mahogany glued in and the holes re-drilled. A good bit of cigar-box wood will do to make the pegs from. Edge-racks in which the teeth are cut on the edge of the strip (like a saw) are more difficult to deal with. With these it is necessary to plug all the screw holes and to make new ones a shade higher so as to bring the teeth into engagement with the pinion. The pinion itself, being usually of steel, rarely needs attention, but if the teeth or leaves of the pinion are damaged a new one must be obtained. These fittings are listed by such firms as Fallowfield, Kodak, and others, and usually only require a touch of the file to adjust them.

Clamping screws sometimes cease to hold owing to the thread being worn. A washer placed under the head will often bring another part of the thread into action. If the plug or nut is worn it must be replaced by a new one, although in some cases a few light blows with a hammer will close it up well enough to serve for a time.

Woodwork is repairable by glue or screws, and I would give a word of caution against trusting to any glued joint which has been allowed to dry without being clamped together until the glue is dry. The less glue that is left between the surfaces the better it will hold, so that we must squeeze out all we can before drying. I am afraid that I cannot give any general instructions for doing this, as the shape of the work varies so much. Ordinary screw clamps as used for holding down sewing machines answer well for two flat surfaces such as the runners on a baseboard; for many other jobs stout strips of wood with small blocks screwed on a little wider apart than the article to be held do very well. The frame, let us say, is glued together, the ends placed between the blocks and thin wooden wedges driven in to give a firm hold. When the wood is thick enough a few small brass screws will add greatly to the strength of the joint.

Small holes and crevices where wood has broken away may be filled with a kind of brown sealing-wax, known to cabinet-

makers as "hard stopping," but it is easier to use a paste made of fine mahogany sawdust and fish-glue. This dries very hard and can be polished over if necessary. Another very useful paste which sets hard is made of dry zinc white, or even French chalk mixed with fish-glue. Cabinet-makers use ordinary glue for stopping compositions, but it has a tendency to get too stiff on cooling to fill the holes easily.

A repair that is frequently needed is the fitting of new velvet in dark slides and the back frames of cameras. This is quite simple if done in the right way, which is to put the glue on the wood and not on the velvet. Ordinary ribbon velvet, to be obtained of any draper is used. This has a selvedge on both sides, which keeps it from fraying. If there is much space to be filled double velveting must be resorted to. This calls for a narrow velvet down the middle of the groove, leaving the wood exposed on each side; upon this a second strip the full width of the groove is placed and well rubbed down. Sometimes one finds a camera or slide fitted with a thick velvet like stiff plush. This is called Utrecht velvet, and as it is not made in the ribbon form the strips must be cut from the piece. In all cases it is necessary that the glue should only be tacky when the velvet is applied. If too liquid it will run into the material and set the pile into a hard mass. The same method of fixing is employed when fitting new flexible joints to dark-slide shutters. The old glue must be scraped off and new glue applied, taking care not to let it run into the joints. The material, which may be strong black linen or thin leather cloth, is then laid on and well rubbed down.

Having done the necessary repairs we can turn our attention to cleaning and re-polishing. I will not touch on French polishing, as it would take too much space to describe, and the details are available in many little manuals. For most camera work the ordinary furniture polishes are sufficient and require no special skill to apply them. If the wood is very dirty and greasy a good rubbing with turpentine will clean it ready for the polish, or the surface may be washed with soap and water. I do not, however, care to wet a camera if it can be helped, so that I recommend turpentine, or if this cannot be obtained, motor spirit or benzole. Methylated spirit or alcohol in any form must not be used, as it will dissolve the polish, as also would ammonia, soda, or any other alkali. A very simple polish, which also cleans the surface, may be made of equal parts of olive oil and vinegar mixed in a saucer and applied with a flannel rubber; when the surface appears to be clean it is polished with a soft duster. A very good polish for cameras and furniture generally is made as follows:—

Raw linseed oil	6 oz.
White wine vinegar	3 oz.
Methylated spirit	3 oz.
Butter of antimony	½ oz.

Mix the oil and vinegar gradually, shaking well, then the spirit and antimony, again shaking.

This mixture gives a good polish with little labour, and does not show finger-marks. It is, so far as I know, the only satisfactory mixture for ebonised woodwork. To leave a nice clean finish it is necessary to rub all mouldings and corners very thoroughly or the polish will collect dust and spoil the look of the article.

A very dilapidated studio stand may be made quite respectable by rubbing down the surface with glass-paper until all scratches and abrasions have disappeared, and then giving two thin coats of black Robbialac, a preparation much used for motor-cars. Your old pine or oak stand will then bloom out as a new ebonised one. The enamel is slow drying, so that the stand should be left over the week-end to dry. It is well to let a week elapse between the two coatings. Head-rests and other metal goods can be treated in the same way. The Robbialac may be had in various colours, but I prefer the black.

Old lens mounts may be renovated with little trouble. Supposing we have an old portrait lens of which the brass-work has become very black, the first thing to do is to remove the cells containing the glasses and put them away safely. Take off the pinion and slip the jacket off the tube, then rub the jacket flange and hood with methylated spirit to which a little ammonia has been added until all the lacquer is removed. Polish all the brass, including the tube, with rottenstone and sweet oil until the surface is quite bright. If there is much corrosion it may be necessary to use a composition known as "polishing brick," which can be obtained from most drysalters in Clerkenwell or from Coope's in Soho. A little of this is crushed up and mixed to a paste with salad oil and rubbed on with flannel till a good surface is obtained. The flange jacket and hood should then be lacquered, but before doing so any trace of oil must be removed with spirit or by polishing with whiting. Hot lacquering is rather beyond the powers of the amateur, so that it is best to use a cold lacquer which is composed of celluloid. This may be colourless or deep or pale gold colour. It is applied by floating on plentifully with a soft camel-hair brush, and allowed to dry for a couple of hours before assembling the parts again. The inside of the tube should receive a coat of dead black, or what I much prefer a lining of black velvet. The lenses should, of course, be carefully cleaned before returning them to their places.

There is one little job which belongs neither to the wood or metal classes, that is the renovation of the bellows. These often get shabby as well as limp, while the inside loses its pristine blackness and is likely to reflect an undesirable amount of light. It is, of course, easier to handle the bellows if it is taken out of the camera, but this takes time, and as glue is used there is a chance of tearing. The camera must be fully extended and the bellows dusted inside and out with a soft brush, followed by a slightly damp cloth, with which any spots are rubbed to see if they can be moved. Any leaks or doubtful places should now be patched with black silk or other thin close material and Seccotine, and strips of the same applied to any parts which have been badly creased. When the glue is dry the inside may receive a coat of dead black, which may be made of lamp-black and spirit, with enough negative varnish added to keep the black from rubbing off, or, better still, Nigrogene, which is the best black for the inside of cameras and lenses I have yet seen. If the bellows has gone very limp it will be better to mix lamp-black with very thin glue and coat the inside all over. This cannot be satisfactorily done without detaching the bellows so that the folds can be pulled flat, otherwise the glue will run into the canvas and make a mess of the job. The outside may now be treated, and I may say that as a rule I have found it better not to attempt to revive the colour, but to give a thin coating of varnish or even a wax polish like Ronuk, which cleans and brightens the surface. If thoroughly faded it is best to dye the bellows black, and this can easily be done with shoemakers' finishing ink, which can be got from any leather seller in twopenny bottles. This is painted on with a soft brush, and when dry polished with a soft shoe-brush. This leaves rather a smoky polish, but it is a good base for a coat of Cherry-blossom or Nugget boot polish. The finishing ink answers excellently for furbishing up Kodaks and other hand cameras that have got rusty-looking. A camera which has lost its freshness by being exposed in a window may be freshened up in five minutes, and there is no trace that it has been done, as there would be if varnish of any kind had been used.

PRACTICUS.

HOW TO PREPARE PHOTOGRAPHIC SOLUTIONS.

[In the following paper, previous instalments of which have already appeared, Mr. J. I. Crabtree of the Eastman Rese arch Laboratory, deals in a most explicit and comprehensive way with the practical methods of making up photographic solutions in bulk and with the chemical proportions which require to be taken in accordance with the properties of the substances which are being handled. Although contributed for the information of cinematograph photographers to the "Motion Picture News" there is scarcely a single paragraph of it which does not apply to the customary operations of any photographer working upon a reasonably large scale; and there is, we think, no photographer so fully expert in the compounding of such solutions as developers, fixing baths, etc., who will not get some practical hints from it.—Eds. "B.J."]

(*Continued from page* 395.)

Purity of Chemicals.

The Water Supply.—Water is the most important chemical used in photography, and it is therefore important to know to what extent the impurities present may be harmful to the various operations and how these impurities may be removed.

Excluding distilled water, rain water, and water from melted ice or snow, the following impurities may be present:

1. Dissolved salts such as bicarbonates, chlorides, and sulphates of calcium, magnesium, sodium and potassium. In case calcium salts are present and a developing formula is used containing sodium bisulphite or potassium metabisulphite, fine needle-shaped crystals of calcium sulphite are apt to separate out in the developer as a sludge on standing. The sludge is harmless if allowed to settle, though the developer is robbed of sulphite to the extent of the amount required to form the sludge. If the developer is agitated, the sludge will cause trouble by settling out on the emulsions of plates, films, etc. Other salts have usually little effect on a developer, although chlorides and bromides exert a restraining action.

Dissolved salts often cause trouble by crystallising on the film after drying, and although not always visible as crystals to the eye, they detract from its transparency.

2. Suspended matter in the form of dirt and iron rust, which if not filtered or allowed to settle will cause spots.

3. Slime, consisting of animal or vegetable colloidal matter and which is not removed by filtering. If such water is used for mixing solutions, the colloidal matter gradually coagulates and settles out in the solution as a sludge.

4.—Dissolved gases such as air, sulphuretted hydrogen, etc. *Water dissolves about 2 per cent. of air at 70 deg. F. and when a developing agent like hydroquinone is dissolved without the addition of sulphite, the oxygen present in the water combines with the developing agent forming an oxidation product which will cause chemical fog.*

Sulphuretted hydrogen gas present in sulphur water will also cause bad chemical fog, but the gas may be removed by boiling or by precipitation with lead acetate.

Purification of Water.

Water may be purified as follows:

1. By distillation: Distilled water should be used whenever possible for mixing solutions.

2. By boiling: This coagulates the colloidal matter and changes certain lime salts to the insoluble condition which then settle out, while dissolved gases such as air, sulphuretted hydrogen, etc., are removed. Therefore, unless the water contains an excessive amount of dissolved salts it is usually sufficient to boil the water and allow it to settle.

3. By chemical treatment: If large quantities of water are required, chemical methods of purification must be employed, though it is only possible to remove lime salts, slime and colloidal matter in this way.

Excessive amounts of dissolved lime salts are very objectionable, because after washing if drops of water are allowed to remain on the plates or film, when the water evaporates the dissolved salts in the water become visible as a white scum.

The following methods of chemical purification may be adopted:

(a) Add alum to the water in the proportion of one gram to four liters. This coagulates the slime which carries down any suspended particles, and the solution rapidly clears. This method does not remove dissolved salts, while the small amount of alum introduced into the water has no harmful effect on the developer.

(b) Add a solution of sodium oxalate until no further precipitate forms. This method removes the calcium and magnesium salts and coagulates the slime, though sodium and potassium salts are left in solution.

(c) Most of the commercial methods of water softening may be employed, though such methods do not remove sodium and potassium salts.

The "Decalso" process of water softening is one which can be recommended. The water is passed through a tank containing sodium aluminum silicate which is a Zeolite, and possesses the power of exchanging its sodium for the calcium and magnesium present in the water. When the Zeolite thus loaded with calcium and magnesium is washed in a strong solution of common salt (sodium chloride) it exchanges the calcium and magnesium again for sodium and is thus regenerated, and is in a condition for further softening. Full particulars may be obtained from the American Water Softening Company, 1,011, Chestnut Street, Philadelphia, Pa.

Impurities in Developing and Fixing Chemicals.

It is beyond the scope of the present article to indicate all the possible impurities which may be present in photographic chemicals. For a more detailed account the reader is referred to the paper by H. T. Clarke on "The Examination of Organic Developing Agents" (Phot. J. Amer., Nov., 1918, p. 481), which contains a number of analyses of developers recently placed on the market under fancy names and containing such substances as starch, sugar, salt, borax, etc.

In this article we are only concerned with the impurities usually present in chemicals which are not intentionally added as adulterants.

Impurities may have access to photographic chemicals in three ways: (a) during manufacture, (b) during storage, (c) during mixing and storage of the solution.

(a) If chemicals of repute are purchased, the photographer need not worry about impurities.

If the Elon, hydroquinone or pyro is coloured, the presence of fogging agents should be suspected, although some coloured samples do not give any more fog than colourless ones.

Many metallic compounds such as salts of copper and tin, metallic sulphides, etc., exert a powerful fogging action even when present only in minute quantities, and should be avoided. The following table indicates the nature and effect of the more common impurities present in the chemicals used for developing and fixing baths:

Chemical.	Chief Impurity.	Effects of Impurities.
Pyro, hydroquinone, etc.	Oxidation products and adulterants	Chemical fog Adulterants weaken the effect of the developer
Sodium sulphite	Sodium sulphate	Keeping properties of the developer are impaired
Sodium bisulphite	Iron and sodium sulphate	Iron gives a dirty red solution with pyro
Caustic soda	Sodium carbonate	Decreases the accelerating power
Hypo	Sodium sulphite	Diminishes the fixing power
Alum	Sodium sulphate and ammonium sulphate	Diminishes the hardening action
Chrome alum	Ammonium sulphate and Sulphuric acid	Excess of acid tends to cause sulphurization of the fixing bath
Acetic acid	Water	Deficiency of acid causes milkiness of the acid fixing bath due to the precipitation of aluminum sulphite

(b) For impurities introduced during storage see "Storage of Chemicals."

(c) If during mixing the water contains dissolved air and the developing agent is dissolved before the sulphite, it becomes oxidised, and the oxidation product formed causes fog. (See "Mixing of Developers," "Storage of Solutions," and article on "Chemical Fog.")

Storage of Chemicals.

Chemicals should be stored in well-corked or well-stoppered jars in a cool dry place, because most chemicals are affected by air which contains oxygen, carbon dioxide gas, and moisture.

(a) Oxygen readily attacks such substances as sodium sulphite, especially in the presence of moisture, converting it into sodium sulphate, which is useless as a preservative. With crystallised sodium sulphite the sodium sulphate form on the outside of the crystals as a powder, which may be washed off and the crystals dried. It is less easy to detect sodium sulphate in desiccated sulphite except by chemical tests.

Other substances which combine with oxygen and are therefore said to be oxidised are sodium bisulphite and potassium metabisulphite, and all developing agents such as pyro, hydroquinone, etc., which turn more or less brown, the extent of the colour roughly indicating the degree of oxidation.

(b) Carbon dioxide gas combines with substances like caustic soda and caustic potash, converting them into the corresponding carbonated alkalis which are less reactive. If caustic soda is kept in a stoppered bottle the stopper usually becomes cemented fast by the sodium carbonate formed, so that it should be kept in a waxed corked bottle. Owing to the solvent action of the caustic alkalis on glass the inside of the glass bottle containing caustic or strongly carbonated solutions becomes frosted, though the amount of glass thus dissolved away will usually do no harm.

(c) Certain chemicals have a strong attraction or affinity for the moisture present in the atmosphere, and gradually dissolve in the water thus absorbed forming a solution. This phenomenon is termed "deliquescence," and the chemicals are said to "deliquesce." Familiar examples are ammonium thiocyanate, potassium carbonate, caustic soda, caustic potash, sodium sulphide, uranium nitrate, sodium bichromate, etc., which should be stored in corked bottles, and the neck dipped in melted paraffin wax.

As mentioned above, it is difficult to prepare a solution of definite percentage strength from a chemical which has deliquesced, though it is usually sufficient to drain off the crystals, or to use a hydrometer, referring to a table giving the hydrometer readings in terms of percentage strength.

(d) While some chemicals absorb moisture as above, others give up their water of crystallisation to the atmosphere, and therefore lose their crystalline shape and fall to a powder, and are then said to "effloresce," the phenomenon being termed "efflorescence." Some crystals do not contain any water, and therefore cannot effloresce.

A very dry atmosphere is suitable therefore for storing deliquescent salts, but not for efflorescent salts. The only way to store chemicals is to isolate them from the air by suitably sealing.

How to Store Solutions.

Stock solutions and developers should be stored in either large glass bottles, earthenware crocks, wooden vats, or tanks of resistive material, and so arranged that the liquid may be drawn off at the side and near the bottom.

Large glass bottles and crocks should be fitted with a right-angled glass or lead tube passing through a rubber stopper wired to the bottle, the tube being opened and closed by means of a pinch cock clamping a short length of rubber tubing.

In case a solution such as pyro has to be stored for a long time and withdrawn at intervals, an absorption bottle containing alkaline pyro may be fitted at the intake, which absorbs oxygen from the air as it enters the bottle after withdrawing part of the solution.

It is often recommended to pour a layer of refined mineral oil on the surface of a solution so as to protect it from the air, though this is very messy when the bottle has to be refilled.

A battery of stock solution bottles is shown in Fig. 3, the bottles being arranged on lead-covered shelves under which a large trough is placed, or, the floor may be so arranged as to form a sink, so that in case of accidental breakage no serious damage is done. This precaution is of special importance in the case of hypo solutions which might otherwise flood an entire building and inoculate the various rooms with hypo dust causing an epidemic of spots.

J. I. CRABTREE.

THE PHOTOGRAPHIC CORRECTION OF NEGATIVES TAKEN OBLIQUELY.

[For the purposes of the French Army Aviation Service, in which he was engaged during the greater part of the war, M. L. P. Clerc has investigated with great thoroughness the mathematical conditions involved in transforming a photograph taken from an inclined aerial camera into one corresponding with that obtained from the same view-point, but with the lens axis vertical. His study has led him to the design of a purely automatic camera carrying out this "redressement." Inasmuch as aerial photographic mapping promises to be an important peace-time application of photography we publish a translation of the text of his paper.—EDS. "B.J."]

(*Continued from page* 399.)

If we draw in the plane T a series of parallels to the direction a_1d (one of the systems of parallels forming the squaring of the map, for example) these straight lines will have their vanishing point in D on the negative H A D. In the image projected by the lens O on the plane H' A' D', the images of these straight lines will be directed all towards the point D' at infinity and will thus be parallel to each other. Every series of parallels in the plane T will thus be represented in the new projection by a series of parallels.

This having been done, consider in the plane T two equal segments a_1b_1 and c_1d_1 on the same straight line (fig. 7) and in this same plane a segment x_1 y_1 equal and parallel to the two others. The two parallelograms $a_1b_1x_1y_1$ and $c_1d_1x_1y_1$ will be represented, in the plane P' M of the new projection, by two parallelograms A' B' X' Y' and C' D' X' Y', and, therefore, equal segments taken on the same straight line of the plane T will have as images, in the corrected projection, equal segments on a straight line.

Consider now (fig. 8) a squared pattern in the plane T such that one of its directions p_1v' coincides with the intersection of the plane T by the vertical plane containing the axis of the taking lens. The two directions of this squaring then have, as images in the plane P H D of the negative, directions which are respectively those of the line of greatest inclination (V H) of the plate and of the horizon line H D. The image of this squaring in the plane of the corrected image will be defined by the angles made with P' V' (image of p_1 v') by the direction P' Q' of the other system of parallels and the direction P' R' the image of p_1 r_1 the diagonal of the squaring.

Calling the angle $r'p_1r_1$ σ and the corresponding angle V'P'R',

Σ', we apply the relation [1] above to determine the directions of P'Q' and P'R' relatively to P'V'—

$$v' p_1 q = \frac{\pi}{2} \quad \tan v' p_1 q = \propto \quad \tan V' P' Q' = \frac{S H}{O H} \tan v' p_1 q = \propto$$

$$v' p_1 r = \sigma \quad V' P' R' = \Sigma' \quad \tan \Sigma' = \frac{S H}{O H} \tan \sigma$$

It will thus be seen that the particular system of squares considered in the plane T has, as its image in the corrected projec-

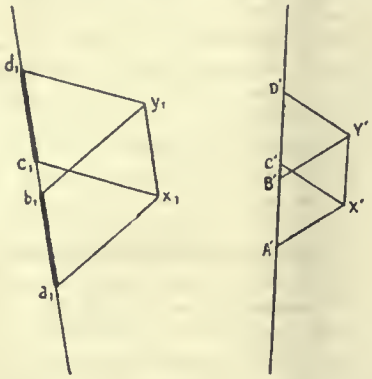


Fig. 7.

tion, a system of rectangles. In order that the corrected image of the squared pattern shall itself be a system of equares, it is necessary that

$$SH = OH \qquad [2]$$

—that is to say that the distance of the horizon line from the optical centre O of the lens used for correction shall be equal to

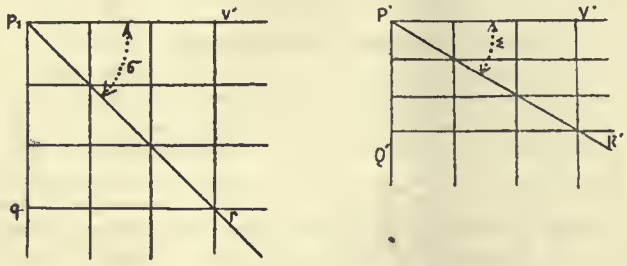


Fig. 8.

the distance of this same horizon line from the optical centre S of the taking-lens.

In all other cases the corrected figure will be a homographic deformed rendering of the squaring projected on the plane of the map, the image being extended or compressed [6] in the direction of the lines of greater inclination of the negative.

If we take $k = \frac{S H}{O H}$, the image will be, in the direction of the lines of greater inclination, extended if $k > 1$, or compressed if $k < 1$.

§6. *Condition of Correction without Deformation.*—Since any figure can always be formed from a squared pattern of infinitely small squares, it will be seen that the corrected figure will be similar to the figure drawn on to the plane of the map if the above condition [2] is observed.

The horizon line being usually not included in the field of the photographic plate, which it is proposed to correct to a horizontal rendering, it is useful to express the condition of complete correction in a form capable of more direct application.

From the right-handed triangles, SPH and OFH,

$$S H = \frac{S P}{\cos H S P} = \frac{F}{\sin \omega} \quad O H = \frac{O F}{\cos F O H} = \frac{f}{\sin \beta}$$

[6] The term *single conversion transformation affine* is sometimes applied to a deformation of an image in which there is enlargement or compression in one direction without alteration in the direction at right angles. In the case where the condition (3) mentioned above is not fulfilled the corrected image represents such single conversion of the projection of the terrestrial region in the plane of the map. Single conversion can be produced only by parallel projection in which the plane of the picture is not parallel to the plane of the original figure, or, as in the present instance, by means of two conical projections. The intermediate image in this case is common to the two projection systems, as is also the corresponding counter axis (the horizon line in the present instance).

The condition [2] is thus written:

$$\sin \beta = m \sin \omega,$$

taking, as before, $f = mF$. [C]

7. The condition [2] worked out in the preceding paragraph can also be established directly from the properties of conical projections and homographic transformations. It can be shown that the locus of the centres of projection O, permitting of projecting from a photographic negative an image similar to that which would have been obtained from the same view-point on a horizontal plate is a circumference, described from the point H as centre, in a plane perpendicular to the horizon line and passing through the nodal point of emergence S of the taking lens. To each point O of this circle there corresponds a single direction of the plane of projection—namely, that of the plane passing through O and the horizon line of the negative (Fig. 9). From this property a graphical construction of the various elements of the system of projection which results in correction may be worked out.

The horizon line being in the focal plane of the lens O, we draw with H as centre a circle of radius equal to the focal length f.

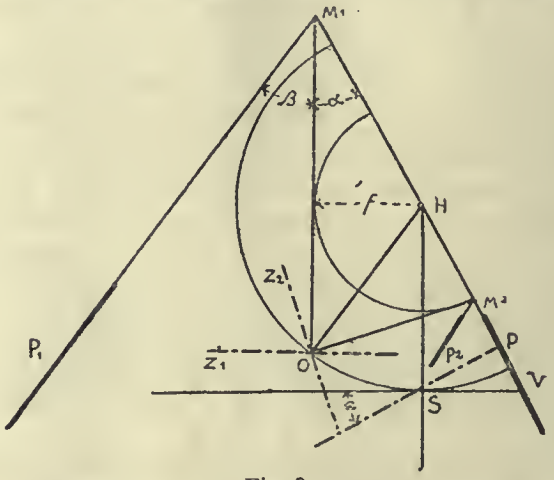


Fig. 9.

From the point O selected draw the two tangents to this circle, which cut respectively the intersection of the plane of the negative in M_1 and M_2. Through the straight lines, perpendicular to the plane of the figure and containing these points, draw planes parallel to the plane determined by O and the horizon line H. The intersections of these planes are their intersections M_1P_1 and M_2P_2 in the plane of the figure. Through O draw the perpendiculars Oz_1 and Oz_2 to the planes OM_1 and OM_2. In this way are defined two positions of the optical axis of the lens O serving for the required correction. The position of this axis in respect to Oz_1 permits the projection of a real corrected image on the plane M_1P_1. The position of the same axis in respect to Oz_2 would give in the plane P_2M_2 an image which is virtual, and thus of no importance. Moreover, on the graphical construction the lengths of the segments intercepted on the optical axis, in one direction or the other from the centre, by the plane of the negative, and the plane of the image may be determined, as well as the angles α and β and the extent d of the decentering.

It will be seen that the choice of the point O on the circle of radius, HS, being purely arbitrary, the problem allows of an infinite number of solutions which thus permits a further condition being imposed, for example, the scale of the corrected photograph.

Suppose, for example, we reproduce with enlargement nP the principal horizontal of the negative the intersection of which is in P, the plane of the corrected image being parallel to the plane of which the intersection is HO. Since the triangles are similar it is sufficient to determine, on the intersection PH of the negative and of the plane of the figure, a point M_1 such that:—

$$\frac{H M_1}{H P} = \frac{O P_1}{O P} = n_P$$

The position of M_1 being once fixed, we draw from this point a tangent to the circle of centre H and radius f. In general, this

tangent will cut the concentric circle of radius HS at two points, O and O′, satisfying the fixed condition. The position O′ of the optical centre of the correcting lens would, however, correspond to the reproduction of the negative at an obliquity such that the operation would be practically impossible.

§8. *Calculation of the Scale of the Corrected Image.*—We will now proceed to discover on what scale n_P the terrestrial area has been photographed on the principal horizontal of the negative, and will then determine the scale n_P for this horizontal at the time of correction. The product N of these two ratios represents the scale of the corrected image.

The scale on the principal horizontal of the negative (fig. 1), calling H the altitude of the view-point S, is

$$N_P = \frac{SP}{Sp_1} = \frac{F}{Sp_1} = \frac{F \cos \omega}{H}$$

In order to determine the enlargement n_P we have given the similar triangles POH and PMP′ (fig. 5)

$$n_P = \frac{P'O}{PO} = \frac{HM}{PH} = \frac{\dfrac{f}{\sin \alpha}}{\dfrac{F}{\tan \omega}} = \frac{f \tan \omega}{F \sin \alpha}$$

and therefore

$$N = N_P n_P = \frac{f \sin \omega}{H \sin \alpha}$$

which may be written

$$\sin \alpha = \frac{f}{NH} \sin \omega \qquad [D]$$

noting that the denominator NH represents the altitude of the view-point reduced to the scale of the corrected image or the equivalent focal length of the corrected photograph.

9. *Correction in Practice.*—Correction is preferably done with a camera such as is used for the copying of transparencies, the negative carrier and the plate-holder being mounted upon a rocking frame pivotted on axes perpendicular to the axis of the lens, the two axes of the rocking frames being parallel.

The negative to be corrected requires to be placed in the carrier so that one of its horizontals is parallel to the intersection of the planes of the negative and of the corrected image, that is to say, parallel to the axes of the rocking frame.

The direction of the horizontals in the negative and the angle of taking ω are supplied either by appropriate clinometers, mounted on the taking camera or even, in the case of a well-known region which presents numerous datum points, by graphic construction.

The conditions which have been worked out in preceding paragraphs and which are as follows:

(A) $\tan \beta = n \tan \alpha$ (C) $\sin \beta = m \sin \omega$

(B) $d = F \dfrac{\cos \beta - \cos \alpha \cos \omega}{\sin \omega}$ (D) $\sin \alpha = \dfrac{f}{NH} \sin \omega$

permit of determining successively β (condition C) in terms of m and of ω which are known: also α (condition D) in terms of f, which is known and of N H which is suitably chosen. We can also determine the amount d of decentering (condition B) in terms of the focal length F of the taking camera and of the angles α β and ω, and lastly, the enlargement n on the optical axis (condition A) in terms of the angles α and β, the known value of this enlargement permitting of fixing the lengths of the segments O A and O A′ limited, on the optical axis respectively to the centre O by the planes of the negative and of the corrected image.

It will frequently be better to substitute for the measure of decentering d, as defined in paragraph 4, the measure of the movement e = A P (fig. 5) to be given to the negative, in its plane in order to bring the principal horizontal to the distance suitable to the horizontal of the negative meeting the optical axis. The extent of this movement is

$$e = \overline{AP} = \frac{d}{\cos \alpha}$$

and should be reckoned positively from the optical axis towards the intersection M of the two planes.

§ 10. *Possible Conditions.*—The geometrical conditions of possibility of correction are shown by the condition that the values found for sin α and sin β (conditions C and D) are less than 1, viz.,

$$\sin \omega < \frac{1}{m} \text{ and } NH > m F \sin \omega$$

The optical considerations limit the angles α and β to values greatly less than the limiting value of 90° obtained on purely geometrical grounds. In practice, angles of 30° should never be exceeded both for the negative and the plane receiving the corrected image.

The possible conditions thus become

$$m \sin \omega \leqslant 0{\cdot}5 \qquad \frac{f}{NH} \sin \omega \leqslant 0{\cdot}5$$

$$\sin \omega \leqslant \frac{1}{2m} \qquad NH \geqslant 2 m F \sin \omega$$

It will thus be seen that the correction will be possible for values of the angle ω greater in proportion as the ratio m of focal distances (of correction and taking) is small; that is, as f is small, and, on the other hand, in the case of a negative taken under a given angle, the corrected image can be brought—without limitation of maximum scale—to a scale small in proportion to m.

From all these considerations it is advisable to select for the correcting camera a lens of the minimum focal length compatible with sufficient covering power and freedom from distortion over the required field and with the necessary provision for decentring.

11. *Cartographic Use of the Corrected Negatives.*—It must be noted in the first place that the corrected photograph is not identical with the map, but is only similar to the conical projection of the terrestrial region made from the centre S on to a horizontal plate T (fig. 10).

In the image taken obliquely and corrected without deformation the property of the central principal point P no longer applies to

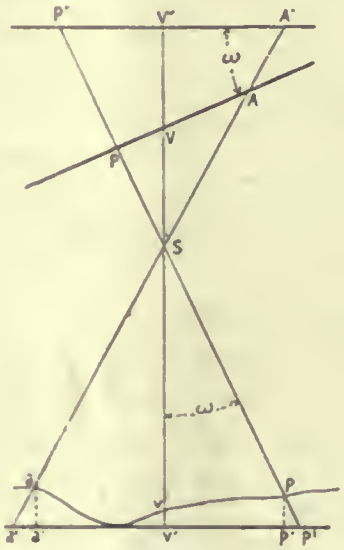


Fig. 10.

the image P′ of P, but, in the case of correction on a horizontal plate, to the image V′ of the vanishing point of the verticals, and, in the case of correction on a vertical plate, to the image H′ of the principal horizon point H.

L. P. Clerc.

(*To be continued.*)

Demonstrations of the Carbon Process.—Secretaries of photographic societies who may wish to include a demonstration of carbon printing in their syllabus, should note that the Autotype Company offer them facilities for doing so. The Company does not send out lecturers, but is ready to supply all necessary materials for a demonstration, sending exposed carbon tissues ready for development together with transfer papers and such literature as will enable anyone having even a short experience in the process to give a demonstration. The arrangements, in fact, admit of members of a club entering into a species of competition in carrying out the instructions sent by the Autotype Company. Application should be made to the Company at 74, New Oxford Street, London, W.C.1.

A COPYRIGHT INFRINGEMENT CASE.

Keogh Bros., Ltd., v. Leventhal.

Judgment has recently been given in the Chancery Division of the High Court of Justice, Ireland, by Mr. Justice Powell in a case of infringement of copyright which, while not providing any fresh interpretation of copyright law as modified by the 1911 Copyright Act, possesses some interesting features. The following is an abridged summary of the proceedings, abridged that is from the citation of them contained in the judgment of Mr. Justice Powell. We reproduce verbatim only that portion of the judgment which deals specifically with the application of the 1911 Act to the circumstances of the case.

The defendant firm had published a postcard entitled "Easter, 1916," and also a large photogravure of the same subject in which was depicted a group of fourteen members of the Irish rebellion seated round a table. Certain figures in the group appeared to be copied from photographs of the persons taken by the plaintiff, but the defendant denied that this was so, and stated that he bought an oil painting from an artist named Rogers, and that this painting was an original work from which he reproduced the photogravure and the postcard.

The plaintiff firm had made certain group photographs in circumstances which entitled it to the copyright in them, and had produced for publication and sale certain cabinet photographs made from single figures in these groups and representing Michael O'Hanrahan, Thomas J. Clarke, and Cornelius Colbert. There had been a considerable sale of these enlarged photographs, and the photographs had been reproduced in Irish and English newspapers, and reproduction fees had been paid to the plaintiff firm. The plaintiff showed that the three single enlarged cabinet photographs of O'Hanrahan, Clarke, and Colbert were identical with the three photographs of these men in the photogravure and postcards issued by the defendants. There were slight differences such as could have been made in reproduction, but the faces were identical.

The defendant stated that the reproductions were made from an oil painting in black and white made for him by an artist named Rogers, and that he was not aware of the methods adopted by Rogers or of any copyright in any of the portraits. Under cross-examination, he said that if he knew they were from photographs he would have asked about them. He said he knew they were from something. He made no inquiry.

Mr. W. J. Rogers, the artist who had produced the infringing work, said that in 1917 he conceived the idea of producing and composing an original sketch of leaders of the rebellion done in pencil; that he did not get any of the three sketches from the plaintiff's photographs; that he saw them in the Press; that he had no photographs beforehand; that he transferred them to the cardboard of the oil painting, and then painted them in in black and white in oils, afterwards taking them to the defendant with whom he made a contract. Under cross-examination, he admitted that he had seen Colbert's portrait with the plaintiff's name on it in the "Irish Times," that he had seen Clarke's photograph in the "Irish Times," but did not notice plaintiff's name to it, and that the only photograph he had seen of O'Hanrahan had been in the "Irish Times."

The defendant, recalled by the Judge, stated that the photogravures were first sold on May 8, 1918, and that he learned that the sale of these pictures was prohibited at the end of September, 1918, and he ceased selling after that date.

Plaintiff, recalled by his counsel, stated that he had been publishing the cabinet photographs from 1917 down to the time of the hearing in the public Press.

It was submitted by counsel for the defence that Mr. Rogers was able from memory to produce these sketches of the persons represented, but even if that explanation were not accepted, it was contended that the photogravures were not an infringement even if taken from the plaintiff's photograph. It was argued that the object of the 1911 Act was the same as that of the 1862 Act, namely, to protect the owners of the copyright in their reputation. Counsel referred to the case of Hanfstaengl v. Baines (1895) and Hanfstaengl v. Empire Theatres. He said that the reproductions, even if copies of the three enlarged photographs, could not be said to be injurious to the plaintiff. The reproduction was a group; it did not compete with the photographs of the plaintiff. It had no effect on the artist's reputation, nor on its commercial value, and he referred to the fact that the sale of the photogravure and the postcards had been forbidden under the Defence of the Realm Act. It was argued that the Court should not restrain defendant from selling when, in fact, there had not been a sale there was no evidence of a future intention to sell, and that therefore no injunction should be granted. Counsel stated that the plaintiff had expressed their intention to circulate the same group, and that there was no evidence of damage.

Counsel for the plaintiff contended that even if the production had been brought about by memorising, this would be an infringement, and he strongly relied upon the similarity between the portraits in the postcards and in the photogravure and those in the cabinet photographs, pointing out that even two negatives taken on different occasions could not produce such a likeness.

Mr. Justice Powell, in the course of further reviewing the evidence said he could not bring himself to accept the story of Mr. Rogers He did not believe it would be possible for him by means of the process which he detailed to procure a production in the postcard or in the photogravure of photographs practically identical with the cabinet photographs in question. He had come to the conclusion that the group was arranged by the defendant and Rogers together and pointed out that the defendant had not contradicted this evidence, but had stated that he did not remember making the statement to a representative of plaintiff's solicitor to the effect that he and Rogers had arranged the group. On this interpretation of the evidence presented to the Court, the judgment of Mr. Justice Powell in respect to the application of the Act to the circumstances of the case, was as follows:—

Under Sect. 1 (1) of the Copyright Act, 1911, copyright subsists in every original literary, dramatic, musical, and artistic work, and by the definition clause [Sec. 35 (1)] "Artistic Work" includes photographs.

By Sect. 21 the term for which copyright shall subsist in photographs shall be fifty years from the making of the original negative from which the photograph was directly or indirectly derived, and the person who was owner of such negative at the time when such negative was made is to be deemed to be the author of the work. By Sect. 1 (2) for the purposes of the Act copyright means the sole right to produce or reproduce the work or any substantial part thereof in any material form whatever. By Sect. 2 (1) copyright in a work, that is, copyright in a photograph (*inter alia*) shall be deemed to be infringed by any person, who, without the consent of the owner of the copyright, does anything, the sole right to do which is by this Act conferred on the owner of the copyright. In this case the defendant has reproduced, as I hold, the three cabinet photographs, placed them in the group in the postcard and photogravures and offered for sale and sold them. By Sect. 2 (2) copyright should also be deemed to be infringed by any person who sells or by way of trade exposes or offers for sale or hire, or distributes either for the purpose of trade or to such an extent as to affect prejudicially the owner of the copyright, or by way of trade exhibits in public any work which to his knowledge infringes the copyright, or would infringe the copyright if it had been made within the part of H.M. Dominions, in or into which the sale, exposure, offering for sale or hire, distribution, exhibition, or importation took place. Sect. 5 (1) provides that, subject to the provisions of the Act, the author of a work shall be the first owner of the copyright therein, provided that where, in the case of an engraving, photograph, or portrait, the plate or other original was ordered by some other person, and was made for valuable consideration in pursuance of that order, then, in the absence of any agreement to the contrary, the person by whom such plate or other original was so ordered should be the first owner of the copyright. In this case neither the plate nor original was ordered by any other person.

It is suggested on behalf of the defendant that he is not liable because he was not aware that the plaintiffs had any copyright in these photographs, relying, I take it, on Sect. 2 (2) of the Act of 1911; but this section and sub-section must be read together with Sect. 2 (1). Here the plaintiffs allege that the defendant himself although warned by the plaintiffs, persisted in doing several acts the sole right to do which is by the Act conferred on the plaintiffs as the owners of the copyright. He has reproduced these photographs in his picture postcard and in his photogravure, and the meaning

of Sect. 2 (2) is that not only the person who reproduces a copyright work is liable to an action, but persons who deal with infringed copies may also be liable, the latter, however, only if they do so knowingly. I, therefore, do not think that Sect. 2 (2) applies in this case as to confine the plaintiffs to the remedy by way of injunction only provided by Sect. 8, but if it were necessary I am quite prepared to hold, on the evidence, that the defendant knew that the plaintiffs had a copyright in these photographs, and that he was infringing the copyright because rejecting, as I do, the version of Rogers and himself as to the alleged history of the picture postcards and the photogravure, and believing, as I do, that, as regards the three men in question, their photographs (cabinet) were reproduced from the plaintiff's photographic groups, it is, in my view, impossible that the defendant could not but be aware that these photographs of the groups were the property of the plaintiff, seeing that the name and address of the plaintiff is stamped upon the three photographs of the groups from which, as I hold, the reproductions were taken.

On this point I have been referred by counsel for the plaintiffs to the case of Byrne v. the "Statist" Co. (1914, K.B. 622), and to the judgment of Bailhache J. in that case ("B.J.," Jan. 30, 1914, p 91.—Eds.). There, as the judge points out, the advertisement contained upon its face an intimation that it was translated by the plaintiff, and the defendant's witnesses had stated that they attached no importance to this, and the judge held that they were wrong, and found, as a fact, that there was reasonable ground for suspecting that there was copyright in the plaintiff's translation.

Mr. Browne put forward an alternative defence, contending that the oil-painting and photogravures and picture postcard were not an infringement of the plaintiff's copyright, even if taken from the plaintiff's photographs, the object of the Acts of 1862 and 1911 being to protect owners of copyright in their reputation, and that the group photographed in the picture postcard and in the photogravure, and painted in the oil-painting, even if copied as regards the three men in question from the plaintiff's photographs, was not the infliction of an injury upon the plaintiff's; he says that these productions of the defendant constitute entirely different work, but as regards the latter point, it was held by Romer J. on "Brooks v. Religious Tract Society" (65 W.R., 4 76) that where one found a direct copy of a substantial portion of a copyright work, that substantial portion constitutes an infringement if it was a copy in an ordinary sense. On the point as to whether the infringement here was an injury to the plaintiffs, Mr. Browne relied upon the judgment in the case of "Hanfstaengl v. Baines," and the observations in the judgment by Lord MacNaghton at p. 29 to the effect that if the object of the Act of 1862 be, as he supposed it was, to protect the reputation of artists and preserve intact the commercial value of artists' work, it appeared to him that the sketches in the *Daily Graphic*, of which the complaint was made, were not within the mischief which the Act was designed to repress. There could not, he thought, be any possibility of any injurious effect on the artist's reputation, nor could the reproduction in any conceivable circumstances detract from the commercial value of the artist's work or come into competition with it or any reproduction of it. It is quite enough, as it seemed to him, to place the sketches in question alongside any photograph of the pictures of which they were alleged to be piratical copies. In that case the appellant was the owner of a copyright according to German law in certain pictures painted in Germany. At the theatre of the Empire Palace, in London, representations were given of those pictures, and sketches of the pictures were published by the respondents in the *Daily Graphic* newspaper with explanatory letterpress. The appellant brought an action against the Empire Palace, Limited, and the respondents to restrain them from infringing his copyright by their respective representation, and for damages, and it was held by the Court of Appeal, affirming Sterling J., that the living pictures were not an infringement of the copyright. Upon the motion for an injunction against the respondents in the case under review, Sterling J. granted an interim injunction, and the order was discharged by the Court of Appeal, and from this decision the plaintiff appealed. Lord Herschell pointed out in that case that it was not accurate to say that the living pictures were copies of the paintings. It is admitted, he says, that the faces at all events are different. It is not shown, he says, that the countenances of the living persons who figured upon the stage bore any close resemblance to those depicted by the artist. In some cases, he says, this difference would be all-important. Lord MacNaghton apparently adopts this statement of Lord Herschell, as appears by what he says that to place the sketches in question alongside any photograph of the pictures of which they were alleged piratical copies would convince anyone that they could not come into competition with the picture or any reproduction of it. But I do not think that this applies in the case before me, because, save for wholly immaterial differences, the photographs of the three men in question in the defendant's productions are, as to their faces, really reproductions of the photographs of these men taken by the plaintiffs.

I am therefore of opinion that the plaintiff is entitled on the whole case to an injunction restraining the defendant, his servants and agents, from making, publishing, selling or offering for sale, any copies, reproductions, or imitations of the plaintiff's photographs of these three men, or any of them, or otherwise infringing the plaintiff's copyright therein, and to an account and delivery up of all paintings, copies, and imitations of these photographs, together with all blocks, plates, and other devices used or intended to be used for the production of such infringed copies, reproductions, or imitations in the possession, custody, or control of the defendant, his servants, or agents.

I do not think it necessary to declare the plaintiffs entitled to an account of profits. As regards damages, I have no materials before me for assessing more than nominal damages. On this point, Counsel for the plaintiffs have referred me to the statement in Mr. Coppinger's work at p. 199 that the measure of damages under S. 6 (1) will be the loss which the proprietor of the copyright has suffered by reason of the diminution of the sales of his work, or the loss of profit which he might otherwise have made. The fact that pirated work may have injured the reputation and vulgarised the original is also a fact that may be taken into consideration in assessing the amount of damages, and the case of "Henfstaengl v. Smith" (1905, Ch. 519) is referred to. In that case, on the question of damages, Mr. Justice Kekewich says that he was struck by the view supported by the plaintiff's witnesses that such a publication as appeared in the magazine referred to vulgarised that of which it is a reproduction—that is, tends directly to prevent the sale of the plaintiff's goods by reason of the familiarity of the public with the base form. Notwithstanding that fact, he declared the plaintiff entitled to a verdict in nominal damages only.

I am not prepared to hold that the inclusion of these three men in a group amongst other men whose photographs appear in the three productions complained of vulgarises that of which it is a reproduction. The sale of these productions of the defendant has been, in fact, suppressed, and was suppressed at an early stage. No doubt it is stated in Mr. Coppinger's work at p. 199 that the damages may be said to be at large, but that does not mean that I am to make an arbitrary award of damages. I will award the plaintiffs the sum of £1 for damages, and, of course, the defendant must pay the costs.

A Book of the Cinema.—Messrs. Harper and Brothers, New York, have just issued a large and well-illustrated book on the making of motion pictures, largely historical, but dealing in a popular way with the making of film pictures of all kinds. The author is Mr. Homer Croy.

The Photographic Convention at Oxford.—After the suspension of its meetings since 1914, the Photographic Convention met last week at Oxford, under the presidency of Mr. G. W. Atkins. It is eighteen years since a previous meeting of the Convention was held at Oxford, and in an address of welcome to the members, Mr. G. W. Norton referred to the changes in its membership which so long an interval of time had brought about. On the evening of Thursday last week, July 10, Sir Cecil Hertslet delivered a most interesting lecture on his experiences at Antwerp as Consul-General for Belgium during the invasion of the country in August, 1914. Excursions were held during the week, on the Wednesday, by river launch to Abingdon and Sutton Courtney, and on Friday last to the Vale of the White Horse. The annual dinner was held at the Clarendon Hotel, and was followed by an excellent musical programme of Mr. J. Gilbert Wiblin.

Photo-Mechanical Notes.

Progress in Rotary Gravure.

Mr. C. W. Saalburg, who has taken out many patents for improvements in rotary photogravure, the novelty of some of which we have ventured to dispute, has been granted a United States patent, No. 1,290,786, for printing a grain on carbon tissue and superposing this over the tissue containing the usual screened image. He claims this avoids "devils," and has other advantages.

From the peculiar appearance of the shadows in most machine-printed photogravures, it was often supposed, in the early days, that there was a supplementary grain applied to the plate somehow; but since the process has become less secret it has been found that the effect is simply due to the specific character of the ink used and the way it dried on the paper where it was thickest—that is, in the shadows.

It has often been remarked that three and four colour work in rotary photogravure looks flat: sparkling oil paintings reproduce as though the originals were pastel drawings. Attempts have been made to overcome this by printing on to glazed or gelatinised paper. Silks and mercerised cotton should provide a glossy surface that would overcome this defect, and printing on these materials should also have the advantage that a little want of register, which is very difficult to avoid entirely in rotary photogravure, would escape notice.

Before the war many experiments were being made in applying this process to the printing of wall-paper and textiles; of course, they were kept closely secret, and presumably have been dropped during the war. No doubt they will now be resumed, and great progress is certain along these lines sooner or later.

Hints on Metal Printing.

The copper offered the engraver is often none too well buffed and polished. Sometimes scratches are quite obvious, and in this case there is nothing for it but plenty of elbow grease, first using fine pumice powder and afterwards charcoal, until all the scratches are removed. But sometimes the surface appears free from scratches which, however, appear after the etching is done. Apparently in manufacture the copper sheets have been ground with a coarse grit, and some of the deeper scratches have not been afterwards polished away, but have been merely burred over. In this case the only thing that may help at all, if such a condition is suspected with any given lot that cannot be exchanged, is to use a negative that will stand a heavy printing and an enamel solution that is thicker than usual. To make printing on metal as uniform as possible, all conditions should be kept as uniform as possible, for example, the enamel solution should not only be made up to the same formula, but should be tested with a hydrometer, and always used at a definite strength or, rather, viscosity. Then if the whirling is uniform and the light the same, and kept at the same distance from the frame, the exposure will be the same and development also. A good average figure is 10 deg. Baumé, but this may be much lower if conditions will permit of a thinner solution, and this is advantageous as it shortens the time of printing considerably. There is no need to waste any of the enamel solution that drains off the plate; even the first coating which carries away the water may be saved and made up to hydrometer strength with the addition of some thicker solution. Filtered, it is just as good as fresh solution. Enamel is much more liable to come off zinc and brass than it is off copper. Too copious rinsing with water seems to be the most potent cause of losening the enamel film.

Film in Photo-Mechanical Work.

In the United States film is being increasingly used in black and white work, particularly in rotary photogravure. Films of several degrees of contrast are available. In large sizes they are cheaper than dry-plates, and they do not suffer from the disadvantage of the occasional waviness which characterises the glass of the average dry-plate, but the chief reason for their preference is that they can so easily be cut up and fitted together in any position required to make the large newspaper page, so popular in the Sunday supplements in rotary photogravure which every important newspaper in the United States now runs.

There are not, however, so far, on the market any holders for large-size film, and various devices are used by the operators t hold these films in the dark-slide. One is to place the film on piece of plate-glass and back it up with another piece of glas This is open to the objection that any dust or defect in the glas is reproduced in the negative, and the focus must be altered to allo for the film not being in the usual focal plane.

Another method is to use a piece of thin, flat board—stout card board does, and pin the film on this with drawing pins, then handl just like a dry-plate. Still another method is to lay the film on piece of glass and stick down the top edge with adhesive tape, suc as surgeons use. See that the film is perfectly flat; then stick th bottom edge in the same way, and the slides, too, if there is an sign of curl. Both of the latter methods seem quite satisfactory.—A. J. N.

A Problem in Half-tone Photo-Lithography.

One of the drawbacks in connection with photo-lithography, par ticularly in colours, is that it is next to impossible to do an retouching or correcting on the printing surface, and even if i were possible it would be impracticable for those step-and-repea processes in which the original negative, and not a transfer, is use to make every repeat. So the retouching must be done on th negative, and if continuous-tone negatives are made, this is not s difficult, as is obvious in the beautiful collotype reproductions i colour, such as the Medici prints, which must have considerabl retouching, all done on the negative before the collotype plate i made. But the lithographer who wants a grained negative does no want to use the indirect process if it can be avoided, yet if h makes cross-line screen negatives direct, he finds them difficult t retouch—practically impossible. So usually a continuous-ton negative is made on a plate the glass side of which is ground s that it will take pencil readily on the back as well as on the film A positive is made from this which can be still further retouched and the screen negative made from this, when (if the work ha been properly done) no retouching could be required on the plate

W. C. Huebner, one of the inventors of the Huebner-Bleistei step-and-repeat machine for photo-lithography, has recentl obtained a U.S. patent, No. 1300729, for a somewhat differen method. He apparently dislikes the cross-line screen; at all events he sets forth in his specification several disadvantages, and appear to imagine you can get a greater range of tone with an irregula grain. As in either case you are limited by the black of the soli printing ink at one end and the white the colour of the paper o which you have to print at the other, it is difficult to see how yo can get a longer range of tone with one method than with the othe However, apart from his reasons, his method is certainly ingenious for he takes an ordinary continuous-tone negative or positive, re touches this in the usual manner, and then prints from it on to bichromated gelatine solution spread upon glass, which solutio contains calcium chloride or other substance to cause it to give grained effect; in other words, he produces a grained collotyp plate. He now inks this up or treats it with opaque powder, an then uses it as his negative to print on his plate, and thus obtain his grained photo-lithographic printing surface.

Ceramic Half-Tone Screens.

A process for the making of half-tone screens which has been pr tected by patent is described in specification No. 124,608 by M E. W. Smith, of 69, Alexandra Road, Hornsey, London, N.8.

Mr. Smith draws or engraves on a lithographic stone, zinc block or plate, a line granular stipple or other configuration an after rolling (or inking up) through the medium of an india rubb covered roller, he transfers the design on the stone or plate to sheet of glass. The glass may be held on a moving or fixed be plate of a machine and the roller positioned in a frame so th on the movement of the bed plate or the roller the design can b transferred from the roller to the glass with great exactitude, th roller being adjusted so that the necessary pressure is imparte to effect a sharp and clear imprint.

In rolling or inking up the stone, plate or block having the desig thereon when it is required to be permanent a suitable varnis is used for the purpose such as that known as printers' varnish The design (or configuration) is transferred to the glass as describe

and dusted with an opaque glass enamel or glaze powder or the like and afterwards fired in a muffle or kiln.

The design on the stone or plate can be inked up sufficiently sparely so that it is not blurred when transferred from the printing cylinder to the glass and when dusted with the enamel powder and fired in the muffle or kiln the full depth or density of the design is obtained sharp and clear.

When it is not required that the design or configuration be permanent, instead of dusting with the enamel powder and firing in a muffle or kiln use may be made (after transferring the design to the glass as described) of any dusting powder and the firing omitted in obtaining the desired result.

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Applications, June 30 to July 5.

PRINTING FRAMES.—No. 16,498. Spring arrangement for printing frames. J. F. Hansen.

PROJECTION SCREENS.—No. 16,424. Moving picture display screen. Eureka Screen Co. and W. J. Mellersh.

CINEMATOGRAPHY.—No. 16,714. Apparatus for taking and displaying moving pictures. A. Barnett and E. Esdail.

CINEMATOGRAPHY.—No. 16,735. Cinematograph apparatus. Barr and Stroud and J. W. French.

CINEMATOGRAPHY.—No. 16,601. Cinematograph apparatus. W. R. Campbell.

CINEMATOGRAPHY.—No. 16,467. Means for recording and reproducing sound and for synchronising the same for cinematograph purposes. F. H. Fountain.

CINEMATOGRAPHY.—No. 16,891. Automatic safety control for cinematograph machines. R. M. Geyer.

CINEMATOGRAPHY.—No. 16,546. Automatic safety shutters for cinematograph apparatus. A. H. Marshall.

COMPLETE SPECIFICATIONS ACCEPTED.

These specifications are obtainable, price 6d. each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

FOCUSSING FINDERS.—No. 116,095 (May 16, 1917). The invention refers particularly to the type of focussing finders for photographic cameras which comprise a focussing lens with substantially the same focal length as the lens of the camera, a bellows to

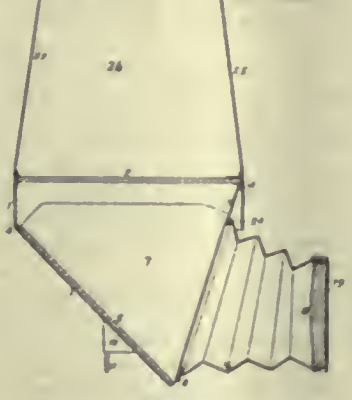


Fig. 1.

the outer end of which the lens is attached, a focussing screen, and a reflecting mirror hinged to the screen. The invention consists principally in this that the bellows, the mirror, and the screen are so connected with one another that they may be folded into a position parallel with one another.

In the drawings, 1 is a rectangular frame provided at its upper four edges with hinges connecting plates 25 and 26, which serve as a guard against outside light on the image recording focussing screen 2, mounted in the upper part of the frame. In order to secure the light guard in its upright position, and at the same time to prevent the entrance of light at the corners between the different plates, the plates are provided on each upright edge with a flange or bend, and hinges so that the plates will press against the upright edges of the plates. The plate carrying the mirror is connected by means of hinges to the frame. To this plate side plates 7 are connected by means of hinges, and the plate 9 by means of hinges 8.

Devices employed in the present instance for adjusting the lens consist of corresponding threads in the lens holder and on the

Fig. 2.

lens mounting, hence by turning the lens it may be moved in the direction of its axis.

The focussing finder is to be adjusted when attached to the camera, the adjustment being effected by focussing the camera by means of its focussing scale on an object whose distance from the camera is known, or on so-called infinite distance, whereupon the lens of the focussing finder is to be moved to and fro by the means above described until the image on the focussing screen is sharp. This having been done for one certain distance, the image will also appear sharp for any other distance, as the focal length of the lens of the focussing finder is the same as that of the lens of the camera. Georg Samuel Lalin, 7, Ryttaregatan, Rasunda, Sweden.

X-RAY PAPER.—No. 125,490 (Sept. 18, 1918). The invention consists in providing a photographic emulsion capable of being successfully acted upon by the actinic rays of radiographing apparatus. This emulsion is coated on to specially prepared paper. The paper is obtained by coating paper with calcium tungstate emulsified in gelatine, or other suitable medium. The record is made direct on to the sensitised material, and this obviates any printing, and only one developmet of the paper is required. Edwin Ebenezer Burnett, Wistowe, Hayes Town, Middlesex.

A LITTLE P.P.A. DINNER.—A very pleasant little function was arranged by the Professional Photographers' Association last week, in the shape of a dinner at Gatti's Restaurant, at which most of the members of the council with a few friends spent the evening together in a semi-formal way. Mr. H. A. St. George, president of the P.P.A., was in the chair, and in proposing the toast of the Association, reviewed the conditions of the past five years which, as he said, had been much less injurious to the photographic business than had been feared. In fact, although longer hours and harder work had been necessary, the increased demand for the photograph created by the war had had its satisfactory results. It was possible to say that, after eighteen years, the Association continued to grow in strength and good repute, and was in a position to meet and to deal with any problems that the future had for it. Mr. S. H. Fry, honorary secretary and treasurer, replied, and said, that while it was not possible to make a positive statement, it was most probable that the Association could hold a congress again next year. Other toasts followed, one being to the visitors, Messrs. Webb and Bell, of the Kodak Company, and Mr. George E. Brown, of the "British Journal," all of whom briefly replied. Letters of regret at inability to be present were read from Mr. Gerald Bishop and Mr. Edgar Houghton. Perhaps the outstanding feature of the speeches was in those by two country members of the council, Mr. F. Read, of Southport, and Mr. T. Chidley, of Chester, laying stress on the fact that photographers were putting aside their feelings of jealousy and aloofness, and were showing a great disposition to meet their competitors in a given town for the general advantage of their common interests. Mr. Lang Sims proposed the toast of the president, and Mr. T. C. Turner gracefully proposed the health of Mr. Alfred Ellis, by whom the arrangements for a most enjoyable evening had been made.

CATALOGUES AND TRADE NOTICES.

THE ADON LENS.—Messrs. J. H. Dallmeyer, Ltd., Church End Works, Willesden, London, N.W.10, send us a small booklet of the Adon lens of variable focal length from 13½ to 49½ ins. The booklet very concisely puts its finger on just those branches of work for which a lens of this kind is most useful, in addition to the ordinary purposes which a telephoto lens serves.

BARNET HELPS FOR BEGINNERS.—A forty-page booklet has just been issued by Messrs. Elliott and Sons, Barnet, Herts, in which Mr. W. L. F. Wastell has some very practical advice to give on exposure, development, and the making and toning of prints. Dealers should not omit to have a few of these booklets on their counters, where its most tasteful cover will attract attention. Single copies may be obtained on application to Messrs. Elliott.

ROSS LENSES AND CAMERAS.—Messrs. Ross have just issued their first catalogue of their photographic lenses and other apparatus which has appeared after the four and a-half years during which their works have been solely devoted to the requirements of the Navy and Army. The new list, which is illustrated with some striking photographs, gives full technical particulars of the Xpres, Combinable, Telecentric, and Homocentric lenses, as well as of the Ross portrait lens and the series for cinematograph cameras and projectors. Those who are buying a portrait lens which can be used to full advantage also for outdoor groups will find much assistance in the table on page 26, in which the dimensions of studio suitable for various lengths of the Xpres and the Ross portrait lens are set forth. The list gives the prices of various models of folding and reflex hand cameras fitted with Ross lenses.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

SATURDAY, JULY 19.

North Middlesex Photographic Society. Outing to Cassiobury Park.
Manchester Amateur Photographic Society. Outing to Dunham Parks.

MONDAY, JULY 21.

South London Photographic Society. "The Eyes of the Army." J. H. Jennings

TUESDAY, JULY 22.

Hackney Photographic Society. Slide Competition: "Woodland Sunshine."

THURSDAY, JULY 24.

Hampshire House Photographic Society. "Spotting and Retouching the Print." J. J. W. Carruthers.
Hackney Photographic Society City Outing.

EDINBURGH SOCIETY OF PROFESSIONAL PHOTOGRAPHERS.

THE last meeting of the session 1918-19 was held on Monday, July 7. Present were: Mr. Young (in the chair), Messrs. Aikman, Bambrick, Swan Watson, Ferguson, Campbell Harper, Johnston, Geo. Balmain, Lauder, Barrie, Scott, Moffat, Miss D'Arcy, and Miss Hutton.

The Chairman intimated that he had received an official letter from the Edinburgh College of Art appointing him instructor of the new retouching class which commences in October. An estimate of the cost of the construction of the necessary apparatus had been obtained and would be submitted to the college.

Mr. Johnston then submitted the report of the Apprentice Committee. He pointed out that the entire subject bristled with difficulties, and, the committee considered, was hardly a matter for a committee at all, but rather for the consideration of the society in general. Personally he was of the opinion that the nature of the profession of photography rendered it very difficult to arrange a definite scheme of apprenticeship. It was not a merely mechanical trade, but one which required a special aptitude in the individual following it out. A girl or boy, having commenced an indentured apprenticeship, might be found to lack the necessary aptitude for the business, and the master would then be left in an awkward position. In a one-man business a system of apprenticeship might be quite feasible, as the learner would be in a position to see and acquire all the branches under the personal supervision of the employer; but in a larger concern, where the branches were divided into as many separate departments, the necessary moving of the apprentice from one to another, when he had just begun to be useful in the previous branch, caused considerable disorganisation.

The committee therefore considered that the best method would be to take on young people on trial. If they showed interest and ability they were bound to reach the top of the tree; but if they turned out otherwise it was then a simple matter to part company. Each junior assistant thus employed could learn thoroughly at least one branch. To push him, on the other hand, through every branch during a limited period had not only the disturbing effects before mentioned, but left the assistant with no thorough knowledge in any one department.

Mr. Campbell Harper corroborated these remarks.

Mr. Young thought that the lack of a good apprenticeship system was responsible for much of the inefficient help complained of at the present time. He pointed out that the apprentice was not to be considered as part of the working staff, but rather as an extra. He quoted figures which he had procured recently regarding other industries. The house painters had an apprenticeship of six years, with salaries ranging from 11s. 6d. per week in the first year to 24s. in the last year. Bookbinders and printers had a term of seven years, with salaries from 12s. to 42s.; engravers, six years, with salaries from 9s. to 37s

Mr. Scott thought that to train a man in one department only was a great mistake. The knowledge of other branches, he pointed out, was of great use in the carrying out of the particular branch in which the assistant might finally specialise. He did not, however, favour a system of indentures.

Mr. Young thought that indentures were necessary towards obtaining security. Otherwise an apprentice was liable to leave as soon as he thought that he had gained a little knowledge.

Mr. Swan Watson explained the system under which he had always worked. He had a term of four years, the first two being spent in the studio, dark-room, and in acquiring a knowledge of enlarging. Then eight months were spent in the printing-room, eight months in the retouching department, and eight months in the finishing-room. All his apprentices were taken on six months' trial, during which the apprentice could leave of his own free will, or he could be dismissed if found to be unsuitable.

Mr. Young thought that a set-down training would have the advantage of attracting a better class of boy.

Mr. Moffat then moved that, in view of the foregoing opinions, a new committee should be appointed which would include those who desired to keep apprentices, and who could draw up a scheme to be approved of by the society, and which would remain as a standard system for all those employing apprentices.—Mr. Campbell Harper seconded.

There being no amendment, the following committee was appointed:—Messrs. Swan Watson, Johnston, Bambrick, and Campbell Harper. Mr. Watson was appointed convener.

Mr. Campbell Harper moved that the proposed professional exhibition should be proceeded with, provided a minimum of twelve supporters could be obtained.—Miss D'Arcy seconded.—Mr. Barrie, who did not favour the exhibition, pointed out the difficulty of making it sufficiently interesting to the public, and suggested that the exhibition be an open one.—Mr. Johnston admitted that it would not be one which would attract amateurs or those interested in photography, as such, but he was of the opinion that the general public would be interested. The committee were instructed to seek the necessary support

The committee then placed before the meeting a proposal to raise the annual subscription to one guinea in order that the society might rent a private room in which a small reference library might be inaugurated. It was pointed out that this matter would necessarily be brought before the annual general meeting in October. Those members present unanimously agreed to support the motion.

A letter was read from the Secretary of the Birmingham Photographic Society requesting advice as to whether there was a likelihood of much employment for demobilised soldiers in photography. The Government had approached the Birmingham Society with a request to train men for that purpose. It was the general opinion of the meeting that the market would presently be glutted with

assistants, and that the large number of demobilised Air Force men who had learned some photography in that service would also swell the numbers.

The meeting then closed.

Correspondence.

. *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

. *We do not undertake responsibility for the opinions expressed by our correspondents.*

PERCHLORIDE OF IRON FOR MAKING RAPID PHOTO-TRANSFERS FROM TRACINGS.

To the Editors.

Gentlemen,—This salt is curious, as it works in complete antithesis to the bichromates; the action of light, instead of hardening the colloid film, makes it soluble. If a solution is made up similar to the one used for the old gallic-iron water-bath process, and a piece of stout litho paper is coated by sponge and immediately dried and exposed under a fairly transparent tracing for ½—1 minute in the sun, then inked up with photo-transfer ink and developed in cold water, an excellent transfer is procured.

There seem to be two kinds of perchloride, however: an acid and a neutral one. The acid one will not do for the above. Another curious thing is the fact that if the paper is kept for some time after exposure it gradually goes back to its general insolubility and has to be exposed again, all trace of the first exposure becoming lost. The solution I used is the one given in the B.J. Almanac for ferro-gallic paper.

Colombo, Ceylon. W. Wall.

DRY-MOUNTING WITH A COPYING PRESS.

To the Editors.

Gentlemen,—Apropos your paragraph on dry-mounting a small number of prints, the method I use may be of assistance to others, who, like myself, do not mount a sufficient number to justify the expense of a dry-mounting machine.

I purchased a second-hand foolscap letter-copying press. I place an old polishing plate in the domestic gas oven, and heat until it has attained a temperature in excess of that required. The print is tacked on to the mount in the usual manner, using a laundry iron for the purpose, and is then laid face downwards on a pad of blotting or other paper. As soon as the plate is heated, I put it on the back of mount and quickly place the whole in the copying press and screw down; after about three minutes, the print is ready for removal.

The secret of success lies in getting the plate heated considerably in excess of the actual temperature required, and allowing it to remain in the press until it has cooled below the correct temperature. By this method the correct temperature occurs at some period, and ensures proper fixation. I have mounted a number in this way, and since following the above method I have had no failures, even when using multiple mounts and mounting two tints and print at one pressure.—Yours faithfully,

P. C. Taylor.

Carlton, John Street, Ellesmere Port, Birkenhead.
July 15, 1919.

REVERSAL IN DEVELOPMENT.

To the Editors.

Gentlemen,—In reference to correspondence on reversed images which appeared in your columns during May and June this year, we think the following remarks and the specimens forwarded herewith will prove of interest.

A short time ago one of our customers sent us several positives of unusual kind, obtained when developing some snapshot pictures with amidol. We are sending you two of our customer's negatives and two made by us possessing similar characteristics—viz., a coloured positive image in the lesser exposed parts of the plate with a true negative image in the more fully exposed parts; the colour is due to dichroic fog of a very pronounced character; the plates were very much under-exposed.

We were successful in imitating our customer's results by forcing the development of seriously under-exposed plates in a strong amidol or metol-hydroquinone developer, which was purposely contaminated with small amounts of hypo or other solvent of silver bromide. The explanation of the formation of a positive image is obvious; for, dichroic fog, which forms readily when development is carried out in the presence of a silver bromide solvent, is restrained like ordinary black fog by alkali bromides. The amount of dichroic fog at any point on the plate will be, roughly, inversely proportional to the amount of negative image present, since in the development of the latter alkali bromides are set free in the film early in development, and tend to prevent the formation of the dichroic fog, which develops later.—We are, yours faithfully,

Ilford, Limited.

Ilford, July 11.

A PROFESSIONAL PHOTOGRAPHIC ASSISTANTS' ASSOCIATION.

To the Editors.

Gentlemen,—I have just returned from holidays, and on reading the three numbers of the "B.J." accumulated in my absence I was interested to see the suggestion made at the P.P.A. meeting ("B.J., June 27) that assistants should form an association, and that this week (July 11) Mr. A. Hamilton Smith is proposing a meeting in London to discuss the project.

For us assistants in the north it is difficult to get to London, and I should like to suggest that in various parts of the country centres should be formed—say, Birmingham, Manchester, Leeds, Bristol, Edinburgh, Glasgow, etc. The assistants in these districts could arrange meetings amongst themselves for discussion of the proposal. Once these centres are formed it should be a simple matter to compare results and combine. The attempt has been made before to form an association, but failed, mainly, I think, because of the inability of assistants to get into touch with the moving spirits. If some energetic and *interested* individuals will do their utmost in their own districts to get their fellow assistants in touch with each other personally, I feel sure something will be achieved which will be worth our while as individuals and as a class. I personally am willing to do my bit in the Manchester district should anyone think it worth while spending a little time in order to create, if possible, a little better feeling between employers and employees than the late correspondence in the "B.J." and my own sixteen years' experience have shown to exist. I shall be pleased to hear from anyone interested.—Yours truly,

Wm. Aspden.

165, Church Road, Smithills, Bolton, July 11, 1919.

Commercial & Legal Intelligence.

NEW COMPANIES.

Eastman Kodak Company.—The directors have declared an extra dividend of 5 per cent. upon the Common Stock, payable on September 1, to stockholders of record at the close of business on July 31.

Around the Town, Ltd.—This private company was registered on July 3, with a capital of £250 in 1s. shares. Objects: Photographers' photographic apparatus manufacturers and dealers, etc. The subscribers (each with one share) are:—J. W. Myatt, 37, Victoria Road, Tipton, accountant; H. S. Myatt, 12, Crompton Road, Tipton, iron-works manager. Table A mainly applies.

Photographic Service Co., Ltd.—This private company was registered on July 2, with a capital of £2,000 in £1 shares. Objects: To acquire the business of photographic and general printing carried on by J. de Lysle, at 267, High Holborn, under similar style. The subscribers (each with one share) are:—J. de Lysle, 267, High Holborn, W.C.1, photographic artist; A. Hunter, 115, High Holborn, W.C.1, solicitor. The first directors are:—J. de Lysle and A. Hunter. Registered office: 267, High Holborn, W.C.1.

Answers to Correspondents.

SPECIAL NOTICE.

In consequence of general reduced supplies of paper, as the result of prohibition of the importation of much wood pulp and grass, a smaller space will be available until further notice for replies to correspondents.

Moreover, we will answer by post if stamped and addressed envelope is enclosed for reply: 5-cent. International Coupon, from readers abroad.

The full questions and answers will be printed only in the case of inquiries of general interest.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

R. B.—About the best handbook you can get if you are quite unfamiliar with photography is Watkin's "Manual," which you can buy for a 1s. or 1s. 6d. at Messrs. J. T. Chapmans, Albert Square, Manchester.

P. H.—From the lighting of the faces, it would seem that your light is too low. Try raising it on a platform of boxes. A diffuser would improve matters, and, if thin, would not appreciably lengthen exposure.

H. C.—We advise you to purchase the handbook "Photographic Lenses," published by Messrs. R. and J. Beck, 68, Cornhill, London, E.C., price 1s., which is full of information regarding lenses and their focal length.

R. S.—Very much depends upon the focal length and aperture of your lens. As a general rule, a cubical or conical box 10 ins. or 12 ins. square fixed on the lens hood will answer well. If you could make two boxes, one sliding in the other, you could adjust the distance. You can, of course, judge the effect on the focussing screen.

A. N.—The Dallmeyer lens has a value of about £5 10s., and the Ross of about £2. As regards the Meagher camera, it ie possible only to give a very wide price, since patterns of this maker varied considerably. We should price the 10 by 8 Meagher at from £4 to £8, if in thoroughly good condition. The Lancaster "Instantograph" may have a value of from £2 to £3. All these prices are to a direct purchaser; dealers will give little more than half.

G. W.—If you place three 1,000 c.p. half-watt lamps about 7 ft. from the floor, except the front one, which should be placed as high as possible, you should then get good lighting and quick exposures. A white reflector should be put behind each lamp and a thin calico diffuser in front. Care should be taken that no direct light reaches the lens. For a studio such as you propose the walls should be rather light grey or very pale green. This will shorten exposures and prevent heavy shadows.

N. N.—Brass will not cause any material damage to an acid hypo bath, but as stoneware sinks are supplied fitted with an outlet closed with an earthenware plug, we certainly think it would be better to have this fitted in preference to any metal socket and plug, which is certainly liable to become leaky through the continued action of an acid fixing bath. Messrs. Griffin, as outfitters of chemical laboratories as well as photographic workrooms, could supply sinks of this type, which are, in fact, quite common.

P. W.—If the rear lens is twice the focal length of the complete objective, as is the case with the majority of lenses, the exposure will be four times that required with the same stop in position when the complete lens is used. Some lenses have the rear component more than double the focal length of the complete lens, in which case the exposure will be correspondingly more than four times; but, for practical purposes, you will not be very far out in taking it at four, that is to say, your half-second will be two seconds

C T.—We think the cause of your troubles lies in your practice of using an alum bath after fixing with only a rinse between. Unless prints are given really a thorough wash in four or five changes of water between fixing and aluming there is liability to fade, particularly if fixing has not been thorough. We advise you to use a fixing-hardening bath compound of hypo, alum, sulphite, and acetic acid, and made up according to the formula given by the paper makers—for example, the Kodak Company's working instructions for Velox. If you do this, and particularly if also you have two fixing baths in use and pass prints successively through them, we think your fading defects will disappear.

E. S.—For an all-round light we do not think that you can do better than to fit up an incandescent burner and a watchmaker's or engraver's globe. The latter is a spherical water-bottle on a stand, which throws a strong beam of light on your work while keeping the flame itself at a considerable distance from your head. Some workers tint the water blue with a little sulphate of copper; this would be necessary with an oil light as this is too yellow for colour work. You can get the globes from any dealer in watchmaker's tools, such as Plucknett and Co., of Poland Street, Oxford Street, London, W. For retouching you could throw the beam on a white or opal reflector.

G. C.—Section III. of the Retail Businesses Licensing Order is pretty wide, for it says that "any licence may be issued subject to such conditions and restrictions as may be contained therein. Nevertheless, we think there is nothing in the Order which authorises restrictions to be placed upon the way in which a licensed business shall be carried on—that is to say, of a kind such as you mention. If it is made a condition of the licence that you shall carry on the business in your own name, we hardly know what you can do, because, if you protest against it they may take the licence away from you, but we do not think they would We think it is a case in which they have exceeded the powers granted them by the Order. But if you trade under the name of ——— ——— ——— you must register this name at the office of the Registrar of Business Names, 39, Russell Square, London, W.C.1. The cost of registration is 5s., and certain requirements apply to firms who are registered. The chief of these is that the real names and any former names of the partners shall appear on the stationery and business literature of the firm, but it is not necessary that the names of the partners should appear on the facias of the premises or be otherwise displayed to the public.

The British Journal of Photography.

The Oldest Photographic Journal in the World.

PUBLISHED EVERY FRIDAY. ESTABLISHED 1854. **PRICE TWOPENCE**

TERMS OF SUBSCRIPTION, POST FREE.

UNITED KINGDOM.—One Year, 10s. 10d.; Six Months, 5s. 5d. Three Months, 2s. 9d.

CANADA ... ... AUSTRALIA ... ... NEW ZEALAND ... ... SOUTH AFRICA ... ... UNITED STATES OF AMERICA SOUTH AMERICA ... ... INDIA AND FAR EAST ... ... CONTINENT OF EUROPE ...	*One Year.* Thirteen shillings (13s.), or 3 dollars 17 cents, or 18 francs 50 cents, or 9 rupees 12 annas, or 6 yens 30 sens.
FEDERATED MALAY STATES, BORNEO AND SARAWAK	5 dollars 57 cents.

HENRY GREENWOOD & CO., LTD., Proprietors and Publishers, 24, Wellington Street, London, W.C.2.

IMPORTANT NOTICE TO READERS.—Until further notice agents will supply the "B. J." to order only, as the high price prevailing for everything in connection with newspaper production prohibit the distribution of surplus copies for chance sales. It is therefore necessary in order to ensure the regular delivery of the "B. J." each week to place an order definitely with a dealer, newsagent or bookstall clerk, or to send a subscription to the publishers.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3090. Vol. LXVI. FRIDAY, JULY 25, 1919. Price Twopence.

Contents.

	Page
Ex Cathedra	421
Slow Shutters	422
Practicus in the Studio. By Practicus	423
Time and Lighting	424
Development Papers and Desensitizers. By Walter C. Mann	426
The Photographic Correction of Negatives Taken Obliquely. By L. P. Clerc	428
Patent News	430
Forthcoming Exhibitions	431
Meetings of Societies	432
Commercial and Legal Intelligence	433
News and Notes	434
Correspondence— Flattening Postcards or Prints	435
Answers to Correspondents	435

SUMMARY.

In his article this week "Practicus" deals with the posing of the head, a subject upon which a volume might be written. But the article contains many suggestions to the photographic portraitist. (P. 422.)

The recent paper by Mr. Walter C. Mann, chemist to Messrs. Thomas Illingworth and Co., gives some indication of the measures which makers of printing papers take to avoid defects due to impurities in the paper base. (P. 426.)

The relation of texture in a portrait to the lighting of the sitter and the general question of tonal quality in portraits are the themes of a contribution to the "Photographic Journal of America." (P. 424.)

In a leading article we refer to the qualities which are desirable in studio shutters where the maximum speed may be assumed to be about 1/10th of a second. There is still room for improvement in shutters of this type. (P. 422.)

The death is announced of Mr. Walter D. Welford, at one time sub-editor of "Photography" and an early enthusiast in hand-camera work. (P. 434.)

Some forecasts of Lord Montagu include the making of minute photographic reproductions for transmission by aeroplane post. (P. 421.)

The optical conditions for the correction of a negative taken from an aeroplane with the axis of the lens at an angle from the vertical have been worked out by M. L. P. Clerc for the purpose of designing a rapidly-operated correction camera. (P. 428.)

Particulars of a new type of triplet lens with which apertures of f/2 and larger may be obtained will be found under Patent News. (P. 430.)

A correspondent describes the method of flattening prints or postcards single by hand. (P. 435.)

While the Professional Photographers' Association adopts the policy of admitting the right of every photographer to be a member (p. 432), the Lancashire Society of Master Photographers considers it advisable to consider applications for membership. (P. 433.)

Lack of definition in prints through want of contact with the negative from one cause or another seems to be a more prevalent defect nowadays. (P. 422.)

The amateur may be made a source of profit to the professional not only through his orders for developing and printing, but through portrait business which he may introduce. (P. 421.)

The War Museum is inviting contributions of photographs of historical interest in connection with the war. (P. 427.)

EX CATHEDRA.

Amateurs' Orders. We think that the common idea that the amateur has always been the enemy of the professional is quite a fallacious one, and the attitude of hostility which is frequently taken up is therefore unjustifiable. Mr. F. M. Sutcliffe recently gave an amusing account in a northern newspaper of his experiences with amateur customers, after a launch had taken place at Whitby, and his observations should quite dispel the notion that every amateur is a potential rival. As a matter of fact many photographers find it a paying proposition to cultivate the acquaintance of the amateur, not only for the value of his orders for developing and printing, but for the sake of the portrait and other business which is introduced. One point we need not emphasise, and that is that no attempt to compete with chemists and dealers in respect of prices must be made. The Kodak scale should be the absolute minimum, and when possible a superior class of print or mounting should be brought forward. The well-to-do amateur who can afford to spend one or two hundred pounds on a trip will not be afraid of an extra fiver to have his results developed and finished in the best style. If the photographer takes an intelligent interest in his customer's work he may be able to give him hints which will enable him to do better next time, and he may possibly be able to supply better apparatus. The khaki boom is nearing its end now, and the prudent man will not miss any chance of adding even small amounts to his annual turnover. The semi-amateur who retains a well-paid post in a Government office or bank while actually competing with the professional is not likely to seek out the latter, but the genuine one only needs to be assured of a welcome and he will gladly do so.

* * *

Photography and Aeroplane Post. If the forecasts of Lord Montagu come to be realised photography will soon be playing an important part in the application of the aeroplane to the carrying of mails and to the rapid and economical distribution of information. In a paper read recently before the Society of Arts on aviation as affecting India Lord Montagu looked forward to an aeroplane mail service between England and India in which letters would be carried at the rate of 2s. 6d. per ounce, the ounce permitting of a message of 5,000 words in length, which would cost £416 at the present prices of telegraphic communication. Moreover the aeroplane message could be conveyed, without mutilation in transmission, in forty-eight hours as compared with four or five days for the transmission of a telegraphic message of this length. To these computations Lord Montagu adds the suggestion that photography will be called into service for reducing the size and weight of typed or printed messages to an exceedingly small compass, the photographic reproduction on a

minute scale being enlarged by the recipient. In this forecast of what photography and the aeroplane may accomplish in conjunction he includes the reproduction in facsimile of a complete copy of the "Times" in India within three days of publication in Printing House Square.

* * *

Chromium Intensifier. It is, in our experience, quite rare to find a professional photographer who uses the chromium intensifier; the mercury and ammonia method with all its faults is almost exclusively used, yet the chromium method, in the majority of cases, is so greatly superior both in ease of manipulation and in quality of result, to say nothing of permanence, that only a trial is needed to secure its adoption. The formula will be found in the Almanac, so that it is not necessary to repeat it here, but merely to point out where the advantages of using it come in. In the first place bichromate of potash, although poisonous, is not nearly so deadly as mercuric chloride, and the colour of the solution is a further safeguard. No one is likely to drink even a very dilute solution of it in mistake for anything else; secondly, it is cheaper and can be readily obtained at an oilshop if the local chemist happens to be out of stock. Other advantages are that it has less tendency to choke up details and to give rise to staining, while the necessary washing between bleaching and blackening takes much less time, and, moreover, it is easy to see when it is complete, so that stains from this cause are avoidable.

* * *

Bad Contact. A little point which has several times come under our notice lately is that of unsharp prints caused by a want of proper contact between the negative and the printing paper. This would seem to be due to two main causes, the thickness of many of the brands of paper now used and weakness of the springs of the printing frame. Carbon printers are quite alive to the danger of faulty contact, and as a rule prefer to use the old "box" form of frame, in which the pressure is applied by means of strong springs fitted to hinged crossbars. In these days of feverish haste it is perhaps too much to expect bromide printers to use this pattern, but they should certainly see that the springs, frail as they are, of the ordinary frames are in good condition, and, if not, that they are promptly renewed. In many printing boxes the pressure-pad is simply held down by the hand, and it sometimes happens that a small chip or piece of card prevents it from going home properly, so that one side of the paper has practically no pressure upon it. For all prints over half-plate size a stout felt pad should be placed behind the paper before putting the back of the frame in position. This takes but a few seconds, and makes even contact certain. In some groups which recently passed through our hands some of the faces were far from sharp, that this was not due to the negative was proved by the fact that the unsharpness was not always in the same part of the print.

* * *

Enlarged Negatives. When a considerable number of enlarged prints are required it is generally desirable to make an enlarged negative, for not only can it be printed in an ordinary printing box, but it can be carefully retouched and matt varnished if need be, thus saving an enormous amount of spotting on the prints. It is easy to make a transparency on an ordinary slow plate, giving full exposure and keeping the image rather thin. Few photographers possess any arrangement for making the enlarged negative by daylight, but fortunately it is easy to do it in the ordinary enlarging lantern. To avoid waste of large plates a test exposure can be made by fixing a quarter-plate so as to receive the densest portion of the image, and from this the correct exposure can easily be estimated. Naturally a plate of the same make and speed will be selected if possible, although if the H. and D. or Watkins numbers are the same the actual make of the plate should not be of great consequence. If the original subject has much contrast it is a good plan to use backed plates for both positive and negative, as this will allow of very full exposures being given without causing halation. It is not necessary to provide any special holder for the plate, as three or four glass push-pins will do this effectively, allowing the plate to be placed at an angle if it is needed to alter the position of the subject.

SLOW SHUTTERS.

The attention of makers and users of exposure shutters has been so much engrossed by instruments designed to give exposures of a small fraction of a second that the slower varieties such as are mainly used for studio work have been somewhat neglected. The construction of these has always been extremely simple, and so long as the flap or flaps could be opened somehow no question as to the desirability of saving effort seems to have arisen. The faults in the design of most studio shutters are that the moving parts are comparatively heavy, and that they are not balanced in any way, so that when the motive force is applied by means of a rubber bellows or teat great pressure is necessary to cause the shutter to function. Another place at which much power is wasted is in the bearings of the spindles upon which the flaps are fixed. In many cases the spindles are made of wood, with a small metal pin driven into the ends: a pin working in a plain hole in the wooden shutter casing is a truly primitive construction. It might be contended that the arrangement is efficient for the purpose in view, and the contention would be just if the only object were to make a shutter which would open somehow; but almost every month we find fresh advances in the speed of the plates used for portrait work, so that the action of the shutter assumes more importance. Studio work calls for efficiency in the action of a shutter just as much as press photography does, but in a different direction. A great desideratum is evenness of exposure over the entire plate: any fault of construction which causes slow opening and closing militates against it. Let us take the case of a single flap shutter, which is usually placed so that the flap is raised to open it. If such a shutter be used for a seated figure the head will be the first part of the subject to be uncovered and the last to be covered. When exposures were long, this was of no consequence, but now half a second or even less is commonly given, half of this short time may be lost on certain parts of the plate which may or may not be better for being under-exposed. This defect is aggravated in many cases by the shutter being fixed a considerable distance behind the lens.

It has always been a matter of wonderment to us that no British maker has sent out a simple sector shutter on the lines of those known as the Packard Ideal, Low, and Central. In these there is a rapid opening from the centre, the leaves remain balanced at the open position, and they close quickly when the air pressure is withdrawn. Moreover, the shutter can be set open for focussing without putting any strain upon the rubber ball and tube, and even a leak in the release does not seem to impair its working.

The introduction of the Bowden wire or Antinous release has removed one great trouble in shutter manipulation, viz., leaky balls and tubes; but the cable is not so smooth in working as a good air release, possibly owing to the

very uncomfortable shape of the plunger, which has to be held carefully and cannot be picked up anyhow like a rubber ball.

The uneven action of the flap shutter was utilised many years ago by landscape photographers, who used what was known as a sky-shade shutter in front of the lens. With this it was possible to vary the proportions of exposure given to foreground and sky to any desired extent, while by turning the shutter sideways such subjects as street views with one side in sunlight and the other in deep shadow could have the exposure graduated to suit the lighting. In order to secure satisfactory results the shutter must be lifted by hand, and for this purpose we have seen nothing better than a piece of thread with a small boot button on the end. This obviates nearly all vibration, and may be operated from any convenient position. A very ingenious blind shutter answering the same purpose was made many years ago by Mr. H. Window. It consisted simply of a black linen blind running over a roller in a casing in which were openings for the lens hood. A string was attached to each end of the blind, and all that had to be done was to pull the shorter string when one end of the blind went up till the lens was fully open. Then, on a resumed pull on the cord, the other end of the blind descended and terminated the exposure. This is an excellent pattern of shutter for landscape work—we had one in use for years, and if we remember rightly the shutter was one of the many really practical accessories which were placed upon the market years ago by Mr. Tylar, then of Birmingham—but in the studio any shutter which needs the same attention in operating and requires one to be near to the camera is, of course, useless. We have still some way to go in the design of a studio shutter which shall combine within itself the qualifications of great simplicity of construction, even illumination of the plate at what may be termed almost snapshot exposures, and what is of the first importance for the purposes of many photographers, silence in action. In this last respect it is just as important that the shutter should be silent in its action after exposure has been completed as in opening and making the exposure. The aim of the shutter constructor should be to do his part towards destroying the idea that the camera is a machine in action. From this point of view any click of shutter mechanism, even when it comes after the exposure has been made, must be regarded as an undesirable feature.

PRACTICUS IN THE STUDIO.

[Previous articles of this series, in which the aim of the writer is to communicate items of a long experience in studio portraiture, have appeared weekly since the beginning of the present year. It is not thought possible to continue the series to the length of that by the same writer which ran through the "British Journal" some years ago, but if any reader among the younger generation of photographers, and particularly those engaged as assistants, has a particular subject which might be dealt with, his or her suggestion will be welcomed. The subjects of the previous articles of the series have been as follows:—

A Talk About Lighting (Jan. 3).
The Camera and the Lens (Jan. 10).
Managing the Sitter (Jan. 17).
Backgrounds (Jan. 24).
Studio Exposures (Jan. 31).
Artificial Lighting (Feb. 7).
Printing Processes for Portraiture (Feb. 14).
Studio Accessories and Furniture (Feb. 21).
The Surroundings of the Studio (Feb. 28).
Studio Heating and Ventilation (March 7).
The Postcard Studio (March 14).
The Printing-Room (March 21).
About the Reception Room (March 28).
Home Portraiture (April 4).
Portable Studios (April 11).
Copying (April 18).
Handling the Studio Camera (April 25).
More About Lenses (May 2).
Enlargements (May 9).
Advertising the Studio (May 16).
Mounts and Mounting (May 23).
Business Methods (May 30).
Photographing Children (June 6).
Portraits of Elderly People (June 13).
Something about Lenses (June 20).
Hand Cameras for Professionals (June 27).
The Dark-Room and Its Fittings (July 4).
Plates and Their Work (July 11).
Apparatus Repairs and Renovations (July 18).

POSING THE HEAD.

Many young photographers start on portraiture heavily handicapped by a lack of training not only in the principles of composition and lighting, but in the faculty of observation. If all men were like Apollo and all women like Venus portrait work would be simple, and it would be difficult to make an ungraceful representation, no matter how carelessly the point of view were chosen. But, unfortunately perhaps, the average sitter is far away from the ideal in the matter of looks, even the most comely possessing some peculiarity which, if accentuated by bad posing, will go far to destroy their claims to beauty. The first thing, therefore, which the beginner has to learn is to use his or her eyes so that it is easy to see in what respects the model differs from the ideal, and then to arrange the pose so that these shortcomings are minimised.

The first thing to be learned is to recognise a bad picture when you see one. If you cannot do this there is little hope of improvement. Unfortunately many excellent operative photographers never seem to be able to do this, the technical quality of the negative and print filling all their horizon. Such folk would do excellently with motor-cars or portmanteaux, and should keep to such subjects, leaving portraiture to those whose manipulations may be faulty, but who possess in some degree the power of artistic perception. Many successful portraitists are sadly lacking in technical knowledge, and could not hold a situation as assistant operator for a week, but they know a picture when they see it, and have worked along by slow degrees until they have attained their goal, while the technical expert has to be contented with such sitters whose perception of art is on a level with his own, perhaps occasionally "fluking" a success without knowing he has done so.

I do not propose to touch upon lighting or perspective, but to deal in as simple a manner as possible with the peculiarities of the face, and I would impress upon the novice that his study must be incessant, not necessarily laborious, but as a matter of habit; in every street, shop, train, or bus there are objects for study, and the question as to the best way of treating them should always be uppermost. I think that I have before mentioned the case of a clever retoucher I knew who told me that

she always mentally retouched her *vis à vis* in the tube on her way to and from her work; that is the right spirit, and one that leads to success.

We must never forget that every face has two sides, and that in ninety-nine cases out of a hundred these are widely different, that is to say, that the nose usually curves to one side or the other, that the eyes are seldom the same in size or position, and that the mouth is also more or less unsymmetrical. Besides these easily recognised features there are more subtle differences in almost every muscle, and particularly in the contour of the cheek. Of the general pose of the head little can be said except that it should be well balanced upon the neck, and that there should be no appearance of strain upon the muscles. In these times much more latitude in position is allowed than was formerly customary, and we see many pictures of ladies peeping in from the side of the picture in a position which would have horrified the old portrait painters. There is one mistake which must be guarded against, and that is of having the head turned in one direction while the eyes are looking in another. This is not always the photographer's fault, for if not carefully watched the sitter will turn the eyes to see what is going on at the camera; therefore it should be watched for at the moment of exposure.

The face and shoulders should never both squarely face the camera. If a full-face portrait is desired the body should be slightly oblique to the lens, while in three-quarter-face poses the shoulders may be nearly, but not quite, square.

The eyes, I have already said, are seldom symmetrical, and as a rule it is advisable to turn the larger one to the camera. If one eye is higher than the other it should preferably be taken, but if these two characteristics are not on the same side of the face the operator must make his choice between them. If the eyelids have a tendency to droop the sitter must be told to look up without altering the position of the head; while a tendency to stare must be remedied by looking down. Do not let the sitter know your object in directing the glance of the eyes, as this will probably lead to a noticeable effort to open or close the lids. In the case of sitters who habitually wear spectacles, these should be retained, as the apparent size of the eye is altered by them, and a portrait taken without them may not be approved. Many of the old photographers kept a stock of unglazed spectacle frames for the use of sitters to avoid reflections, but for the reason I have given this practice is not to be commended.

The nose requires special attention, as the whole character of the portrait may be influenced by the choice of sides. As a rule, the side which gives the straightest line should be presented to the camera. If, however, this position is incompatible with the best view of the other features, we must rely upon the retoucher to remedy the defect. At times it is inevitable to avoid calling in the aid of the pencil and knife, but, as a rule, the photographer should forget that retouchers exist. They will still have their work to do, but the more that can be achieved by the lens and the less by hand, the better for the likeness. In the case of long noses, the head should be slightly raised, or, better still, the camera lowered, as this will not affect the pose of the head as a whole, while short or *retroussé* noses need the head to be depressed or the camera raised. It is as well to remember that the camera has a rising front, which can often be used to advantage instead of giving an excessive tilt to get the figure properly centred upon the plate.

The mouth is difficult to deal with, especially where it is habitually open. As a rule, any attempt to alter this results in failure, so that it is better to take a three-quarter view, and, if the nose will allow it, to depress the head a little. Fortunately, the open mouth and snub nose usually go together, so that this can generally be done. It is often complained that the mouth appears too large. This is really due to the fact that there is a shadow from the upper lip beyond the actual opening of the lips, which in the print appears to be a continuation of the opening. This shadow may be lightened by retouching. It is most noticeable when a little excess of top light has been used.

The cheeks must, of course, be considered in conjunction with the rest of the face, but care should be taken to get the most pleasing outline. If the cheeks are at all hollow and the cheek bones high, a nearly full-face position is best. As a general rule, it is not advisable to let the tip of the nose fall upon the outline of the cheek. It should either be well within the face or project beyond it.

Of profiles, little can be said except that, particularly in the case of ladies, it is not advisable to have the head exactly level, a slight turn up or down usually giving a more pleasing effect. Beware of making the ear appear too large. Ears are usually large enough in nature, and a short focus lens intensifies the defect. The forehead, while hardly a feature, calls for its share of attention. A high forehead may be foreshortened by tilting the head forward or by raising the camera, but this must not be done with a bald head. A low one is best taken from the level.

The appearance of the neck is greatly influenced by the height of the camera. A low position lengthens the neck, and a high one shortens it.

It will often be found that all the conditions for securing the best rendering of each feature cannot be obtained at the same time. Then the judgment of the photographer must come into play, and he must decide which can best be sacrificed to the general effect.

PRACTICUS.

TONE AND LIGHTING.

[The anonymous author of the article in our contemporary, "The Photographic Journal of America," which we reprinted in our issue of May 16 last, has followed it by another in which his theme is that constantly present in the mind of the portrait photographer, namely, the influence of lighting upon the tonal quality of a portrait, together with the correlated question of the rendering of textures in a photograph.—EDS. "B.J."]

IT is by no means imperative that the subject be placed at apparently great distances from the light for obtaining tonal qualities, nor for the luminosity of colour values in our monochrome work. All this is possible when the subject is very near the light.

When working in a room without diffusing curtains, where only opaque ones are employed, as is the custom with many of our leading men, it becomes necessary to get considerably away and from under the light, to prevent undue accents.

When the skylight is provided with *clean* and *white* curtains (not dusty and yellowish white), work can be made much nearer the light. If the dark curtains are pulled down directly overhead the chair can be placed under the skylight, if the white head screen is turned at such an angle that it will be interposed between the light and the sitter. This will tone down the light considerably on account of its close proximity to the subject. This, to some, may appear to produce extremely flat results, but if the curtains and the cheese-cloth

head screen are clean, the light will be pure, only much softened. It is very obvious, however, that the use of a reflector (even of a medium plain ground) is rendered less necessary under such conditions.

With the lighting thus arranged a side screen with an adjustable and extended arm may be interposed to tone down the ear nearest the light. It may be covered with coloured cheese-cloth, loosely thrown over to produce any desired effect. Very fine results are thus easily obtainable. A "low-tone" effect will be produced with the isolated white of the ear thrown back in its proper position in drawing, or perspective. The drapery and clothing modified by the draped extended arm of the side-screen will also be in their proper position in attractiveness. Tonality is thus obtained, and the key of tone produced may be medium, low, or very low, dependent upon the nearness of the subject to the screened skylight, and the location of the interposed white head screen, used to tone down the light that falls upon the head and figure.

Pictures made in this way have certain advantages over those made at considerable distance from the light, as there seems to be more solidity to the portrait.

The writer thinks it is conceded that more solid effects are produced nearer the light than at a great distance away. There certainly should be a feeling of actual substance in the human figure. This should always be remembered when making pictures. There is danger, however, in getting too near the light, as well as going to the other extreme.

Too much stress cannot be given to the importance of having the light as pure in quality as possible. Cut down the power of its direct rays. Be careful there is sufficient of it for required illumination, but do not use dust-covered and discoloured screens or curtains. These would render the light weak and dead in quality.

Soften it, but have it as pure as you can make it. This gives substance to the resultant negative. These low-toned effects then will be found to need only a few seconds' exposure with open lenses, to be *fully timed*. Free exposure should always be given if you wish to produce in the negative that which you have taken pains to arrange in your composition.

There are various methods employed for the production of low-toned work, especially by the strictly pictorial workers. But it seems to the writer that the professional should work along lines that will produce these results with a minimum of exposure.

One of our most highly esteemed and successful pictorialists, with an international reputation, who most unfortunately has recently lost, by fire, his entire collection of negatives and prints, often placed his sitters, if I remember him correctly, some thirty or more feet away from a comparatively small window in the slant roof, and where he was obliged to give about a minute's exposure. It may be added that the selection of this shade and the use of this special light were for a definite purpose in his method of work. He also used other windows nearer at hand, not confining himself to the one on the roof.

With those subjects who kept fairly still his results were decidedly pleasing. His methods of work embodied a wide range of pictorial principles which were always a pleasure to see, yet the writer is aware that there are many others of this extreme school of pictorialists who plan to produce work with shorter exposures.

Textures.

The ability of the artist of the brush to produce textures largely determines his standing as a *painter*, and although he may be eminently successful in this sense it by no means follows that he has even fair ability as an artist of the *grand* class. He may be simply excellent in his technique as a painter in just the same way as is the better class of photographers who work solely in the old school methods. They may likewise be excellent in technique which is purely photographic, yet devoid of any artistic qualities, with which is identified the more modern movement in photography.

The photographer, like the painter, may try to put aside his technique in his efforts toward the acquirement of the more worthy and higher standard of his art, but the ability to do so depends much upon his temperament. Late in life this is seldom done. This, however, should not be the case, for it is at this age that his work is liable to be passed by. He should get into the procession, and march with the youngsters. With the aid of his riper judgment, he would likely avoid some pitfalls into which his younger and more energetic brother might fall, thus equalising matters somewhat on the way. Texture is the reproduction in pictures of a likeness pictorially of those things painted, or in our case photographed.

Surface Textures.

With artists, texture painting seems to be indissolubly linked with surfaces and brush work, on the theory that woollen fabrics, rugs, etc., by their powers of absorption or reflection of light, take on a textural appearance that calls for attention to surfaces and brush work, different from that produced by silks, cotton, or polished wood, etc.

In photography, a great deal of this is rendered unnecessary, even to those desirous of following the painters' work in its fullest details. Pictorially, these things are easily recognised in our product as resembling the original subjects, be they hard, soft, smooth, or rough, regardless of what the surface of our medium of expression may be.

We photograph the silk, cotton, cloth, polished wood, and the rug all on the same surface of paper, and can very easily reproduce their pictorial appearance. The painter interprets a mirror, mantel, polished wood, etc., with a different surface from that he does for a rug.

We can reproduce the face, hat, coat, shoes, and furniture, so there will be no mistake in recognising them, whatever the medium used, *providing it is right in the negative.*

To the use of surface texture in painting is doubtless due the introduction of gum-bichromate printing in photography. The successful gum worker, by his handling, has given a distinctive individuality to his work which is very pleasing. This is practically the only process of brush and surface work that photographers have extensively practised, and is in use only by a limited number. The glycerine-platinum development is not practised in this sense, but only for individual effects pictorially, and entirely separate from surface texture.

Whether we employ carbon transfers or special platinum coating makes no difference; *for whatever the surface* may be the result is the same.

Following the painter, therefore, in attention to surface texture, in the practice of photography, is a matter that need not concern us. The question resolves itself into the selection of the best *uniform* surface, whether it be polished, matt, smooth or rough.

Textures Pictorially.

With the textures of the surface eliminated, our relation to "texture" pictorially reproduced in the negative, so that it will in the print be a faithful likeness of the subject photographed, is what is to be considered.

Since the lens is so prone to reproduce every speck or spot so faithfully and indeed slavishly, the question naturally arises, "Can this tendency be overcome when desired?" Certainly it can.

I cannot better answer this than to refer to an incident that occurred at my studio this morning.

I received a visit from a very bright, clever, young pictorial worker, who was advised by one of my New York friends to

call upon me with his samples. He desired to secure a position where pictorial work was the essential requirement.

One of his two best pieces was a working man, wearing a soft, dark felt hat and working clothes. The felt hat shaded his eyes, but the shadow was luminous and the texture of his forehead and face was well rendered. So were his clothes. The lighting, as a whole, was excellent, likewise colour; tonality, on the whole, was good, except in one spot which presented unity, and this was the point of the nose, which being too highly accented had thrown it out of tone. The picture was made on a medium dark ground, and by reducing the edges of the plate, he had much improved what would otherwise have been a monotonous background. He had given variety by reducing the corners of the plate and by throwing the centre of interest to the face to which contrast has been added by the shadow of the hat.

The light on the nose, which by being forward had naturally here received an excess of light, still further assisted in the concentration. This was unfortunate, and injured the picture.

There were one or two minor things, rather unimportant, that might have been improved upon, yet, on the whole, it was very pleasing and exceedingly creditable.

I had commented rather unfavourably upon the symmetrical appearance of a section of the shadow on the ground near the hat. This was procured by "faking," and made the hat itself too prominent at its darkest point, against this light place in the ground. I suggested that the reducing should be done there a little also.

I then asked him what my friend had said about the picture, and was informed that some of the points I had criticised had been remarked upon by him also, but that he had dwelt more especially upon the texture of the hat as being the same as the shadow side of the face, and that the shadow could as well be the hat, or *vice versa*, in as far as they represented the likeness of the original.

I thought I had looked for "texture" myself, but immediately noted that I had been remiss in this respect. Representation of texture is one of the strong points of this absent critic, who is very quick to note its absence. This immediately brought to my mind the advantages to be derived by the interchange of thought and ideas among photographers actuated by a common impulse of mutual improvement, meeting together socially at home, as well as once or twice a year at conventions. I think at our conventions that it would be well for us to go more in groups up and down the line of the exhibits for general discussion instead of alone or with one another.

DEVELOPMENT PAPERS AND DESENSITISERS.

(A paper read before the Royal Photographic Society).

The theory of the action of desensitisers on the photographic emulsion has been dealt with by Sheppard and Mees in their "Theory of the Photographic Process." These notes do not, however, deal with the *general* action of desensitisers on emulsions, but rather with the troubles due to *localised* occurrences of desensitisers in photographic raw papers and baryta coating.

Unfortunately, owing to war conditions, these occurrences have been of a very serious nature during the last three or four years. When one considers that the allied paper mills, whose products enjoyed an enviable reputation for freedom from desensitisers in pre-war days, are not now able to produce the same high standard of quality—it is hardly to be wondered at that our British manufacturers have not yet succeeded in producing a perfect base.

In many respects they have given us an excellent substitute for German products, and one can say they have creditably met many of the numerous requirements as to physical and chemical properties, such as dry strength, wet strength, curl, expansion when wet, freedom from blisters, smooth surface, etc. In the matter of desensitisers in the raw base, they have not so far been quite so successful.

Sheppard and Mees give the following ratios for the desensitising action of metals:—

Copper	3.6
Uranium	4.4
Ferric iron	69.0
Mercury (mercuric) ....greater than	100.0

It must be remembered that these figures apply only to the particular plate used in these tests because, rather fortunately, emulsions vary greatly in their behaviour to these desensitising substances.

Of the four metals given by Sheppard and Mees, the only ones likely to occur in practice are copper and iron. Taking copper first, it will be seen that the desensitising action of this metal is only 3.6, and in actual practice the occurrence of copper compared to that of iron is very small. When it does occur, it is chiefly from the beater bars of the paper-making machinery or from the defective sorting of the rags. Nowadays its occurrence is rare, as naturally the makers have these two points under their control and obviate it. In cases, however, where it does occur, the following notes from a paper by Mr. Strachan on "Dendritic Growths on Paper," read before the Royal Microscopical Society, are worthy of note. In it he states that the particle of bronze is attacked by chemical residues in the paper—chief among which is sulphate of alumina with formation of soluble sulphate of copper.

The latter creeps along the fibres of the paper in solution and the final result in the case of dendritic growths is the occurrence in the paper of fibres impregnated with basic copper sulphate.

The interesting point is the way in which the soluble copper salt creeps along the paper fibre, and in the case of a photographic base paper, this spreading, both in the case of copper and iron, produces a desensitised spot of very visible dimensions from an extremely small first cause. It is, however, iron which causes the most trouble in base papers.

From the ratio figures previously given it will be seen that its desensitising action is very high indeed, being 69 against 3.6 for copper, or nearly twenty times as great. As to its occurrence—anyone who has had occasion to test materials for iron will agree that it is difficult *not* to find it.

The dust in any large town contains sufficient to make it necessary to adopt pretty nearly bacterioligical precautions as regards dust in order to obtain reliable and concordant results.

The usual method of testing for iron is to either immerse the paper in, or swab it over with, cotton-wool soaked in dilute potassium ferrocyanide and nitric acid—by this means the iron is converted into a ferric salt which gives a deep blue spot, due to the formation of Prussian blue. It is, perhaps, preferable to use the "swab" method, as by this means dust on the surface of the paper is removed, and only iron actually embedded in the paper is made evident.

A further method is to use ferricyanide of potassium and hydrochloric acid under the same conditions as previously, *i.e.*, with a swab, and although this test is one for ferrous iron, whilst it is ferric iron which has the greatest desensitising effect, yet one never meets a case in which the reaction cannot be obtained, and in testing under the microscope in the case of desensitised spots on prints this method is most useful. It, of course, immediately bleaches the black silver image and renders the detection of the particles of iron quite easy.

The most delicate test, and one which very few papers will stand, is to use an acid hydroquinone developer, such as is used for the

development of P.O.P., and to add to it a few drops of silver nitrate, for instance;—

Hydroquinone...	16 grs.
Citric acid ...	40 grs.
Sodium acetate ...	1 oz.
Water ...	20 oz.

This is the stock solution, and when testing, a few drops of 10 per cent. silver nitrate is added just before use. When using the solution, however, the utmost care must be taken, as this test is so delicate that touching the paper with the finger will often cause a black impression to develop.

In testing papers for spots, a microscpoe of the type used for the examination of half-tone prints, such as that supplied by Beck, is most useful. The sheet of paper is laid on a sheet of plate glass and the long projecting arm of the microscope allows of the easy examination of the whole of the surface. A miniature electric light bulb is arranged to throw a beam of light on the object, and if attached to the arm of the microscope keeps the portion of paper being examined well illuminated, even if the arm is swung about.

Although in many cases the spot resulting from the densitiser is fairly large, the cause of the trouble is extremely small, and is usually well embedded in the paper base, but with a microscope of the type described fitted with a ½-in. objective—a silver or platinum needle—together with a drop of ferricyanide and hydrochloric acid, there is very little difficulty in getting at the cause of the trouble.

The method of testing raw paper for metallic spots advocated by Valenta, is to soak the paper for about five minutes in from 5 to 6 per cent. acetic acid, and then dry. Then re-soak the sheet in from 3 to 5 per cent. potassium ferrocyanide, and again dry.

The iron spots assume a blue colour due to Prussian blue, whilst the copper spots are a brown colour due to the formation of ferrocyanide of copper.

This method, however, with the intermediate drying, is nothing like so convenient as the use of ferrocyanide and nitric acid, which is the standard method adopted by many paper-makers in testing their raw materials.

The same methods as regards detection are used in the case of spots occurring in the baryta coating, or in the emulsion itself, but the conditions under which the last two are manufactured are much more under control, and spots due to them are of rarer occurrence.

In a photographic paper, the baryta coating serves two purposes: the first and most important of which is to effectively insulate the emulsion from any deleterious impurities in the raw base; the second purpose being to modify the shade and surface to suit particular tastes.

In endeavouring to produce with British materials a photographic sensitive paper equal to pre-war productions, it is evident that manufacturers have had to utilise to the full the insulating properties of the baryta coating and to produce a baryta coating which will resist to the greatest extent the "creeping" action of the iron and copper salts present as impurities in the raw paper.

Fortunately, in the case of development papers, it is not necessary to consider the reverse action—that is, the creep of the soluble silver salts into the paper as is the case in printing-out papers. Even when the utmost precautions have been taken with the baryta coating, the creep of the desensitiser is not *entirely* prevented, and such a minute quantity of iron can produce such a disastrous effect, that it is necessary to take any possible steps to prevent this effect. The problem is not so difficult as it is in the case of a plate.

As pointed out by Sheppard and Mees, the action of a desensitiser may be described as catalytic, so that a very small amount of the desensitiser is able to continually destroy the latent image if given sufficient time to effect oxidisation. In fact, if left for several hours in contact with the desensitiser, the latent image is entirely destroyed.

This length of time, *i.e.*, several hours, may easily occur between the exposure and development of a plate, but in the case of paper, development practically always occurs immediately after exposure, so that the catalytic effect is at a minimum and the decrease in density round the spot or impurity is that due to the *immediate* oxidising effect of the desensitiser present.

As stated previously, the decrease in sensitiveness, due to a definite quantity of iron in contact with the emulsion, is not constant, but varies according to the particular type of emulsion, being different for an acid as against an ammonia emulsion, and also varying with different proportions of the three halogens, chlorine, bromine, and iodine present, so that one can use an emulsion which is affected as little as possible by desensitisers.

In addition there still remains the possibility of the use of a negative catalyst, such as mannite, quinine or oxalates, to re-sensitise the emulsion.

Although the amount of negative catalyst required is large in proportion to the desensitiser, because one must provide at any and every point a sufficient quantity to deal with the maximum desensitising effect, yet by careful attention to the following points:—

(1) The insulating properties of the baryta coating;

(2) The choice of an emulsion as little as possible subject to desensitisers;

(3) Compensation of the desensitiser by a negative catalyst;

it is impossible to produce a development paper on a base containing so many metallic impurities as to be quite impossible for direct coating with emulsion.

The tests which I have for your inspection are intended to show the practical application of the points just enumerated, and may be classified as follows:—

(1) Raw paper tested with ferrocyanide and nitric acid showing the numerous iron spots in the base.

(2) Normal emulsion coated on the above base, showing the numerous desensitised spots due to the iron.

(3) The perfectly even density obtainable with this base when du precautions are observed.

(4) Sheets showing even density with one-half treated with ferricyanide and hydrochloric acid to bleach it. These sheets show that in the particular examples there are numerous iron spots in the base and are a further proof that a perfectly even density has been obtained on a base containing a tremendous amount of desensitiser.

I am glad to say that the quality of the raw base now being produced is a distinct advance on the samples shown, but in order to show the value of the methods indicated it was advisable to give examples showing their action under adverse conditions.

Still, for the production of a development paper as near perfection as possible, it is undoubtedly an asset to be able to make it as resistant as possible to the effects of impurities in the base.

As you are aware, in pre-war days an immense amount of photographic base was imported from Germany, and although up to the present our manufacturers have not quite succeeded in giving us a substitute equally pure, I feel sure that now they are in a position to tackle the problem, by methods unattainable during the war, they will soon reach the required standard, and enable us to produce a development paper which will be British throughout, equal to the pre-war standard as regards the raw base, and, if possible, a little better because we can give added resistance to defects.

WALTER C. MANN.

MESSRS. ILFORD, LIMITED, advise us that the new booklet on "Panchromatism," which deals with certain of their exhibits at the Scientific Products Exhibition, is now in the press, and will be sent on application to any address post free 9d. Those interested in the display of panchromatic results and appliances are at the same time reminded that the Scientific Products Exhibition closes on August 5.

UNOFFICIAL WAR PHOTOGRAPHS.—The Committee of the Imperial War Museum desire to complete their collection of photographs and scenes of historical interest, and invite officers and other ranks who have unofficial photographs of such scenes to communicate with the Keeper of Photographs, Imperial War Museum, 10, Coventry Street, W.1. Prints, with description and titles, should be forwarded for inspection.

THE PHOTOGRAPHIC CORRECTION OF NEGATIVES TAKEN OBLIQUELY.

[For the purposes of the French Army Aviation Service, in which he was engaged during the greater part of the war, M. L. P. Clerc has investigated with great thoroughness the mathematical conditions involved in transforming a photograph taken from an inclined aerial camera into one corresponding with that obtained from the same view-point, but with the lens-axis vertical. His study has led him to the design of a purely automatic camera carrying out this "redressement." Inasmuch as aerial photographic mapping promises to be an important peace-time application of photography we publish a translation of the text of his paper.—EDS. "B.J."]

(*Continued from page* 413.)

THE image corrected without deformation being similar to the image which would have been obtained directly from the same view-point S on a horizontal plate, we can arrange this image in the bundle of rays from S so that each point of this image shall be on the ray coming from the corresponding point of the terrestrial subject, and it is seen that in the image thus placed the rôle of principal point is played by V′, and that of the principal distance or equivalent focal length by the length S P′.

The position of the point V′ in the corrected image can be easily determined by drawing from P′ (defined by the intersection of the axes of the image) on a line corresponding to the line of greatest inclination—i.e., drawing a segment P′V′.

$$P'V' = S\,P' \cos S\,P\,V' = S\,P' \sin \omega = n_P\, S\,P \sin \omega = n_P\ F \sin \omega$$

$$P'V' = \frac{f \sin^2 \omega}{\sin \alpha \cos \omega} = N\,H \tan \omega.$$

The equivalent focal length HSV′ is given by

$$F' = \frac{P'V'}{\tan \omega} = N\,H \text{ or } F' = S\,P' \cos \omega = n_P\ F \cos \omega = \frac{f \sin \omega}{\sin \alpha}$$

$$F' = \frac{F \sin \beta}{\sin \alpha}$$

and it is seen that the enlargement of the corrected image relatively to the image photographed from the same point with the same lens on to a horizontal plate is

$$n_P \cos \omega = \frac{m \sin \omega}{\sin \alpha} = \frac{\sin \beta}{\sin \alpha}$$

We may find the limit of the angle ω for which the vanishing point of the verticals V is included in the effective area of the negative, the camera being assumed to have no sideway inclination in the right-angled triangle SPV (fig. 10)

$$PV = F \tan \omega$$

In the case of a 13 × 18 c.m. camera, with 26 c.m. lens, the limits of PV and the corresponding values of ω are:—

Camera, central lens, "L T 1915 type," $PV \leqslant \cdot 06$ metre $\omega \leqslant 13°$

Camera, decentred lens, "1914 type," $PV \leqslant \cdot 09$ metre $\omega \leqslant 19°$

In the case of panoramic photographs to be corrected to the vertical, the condition of having in the field the principal point of the corrected image, i.e., the point H′, the image of the principal point of the horizon H, leads to the same values of the angle ω, the obliquity of the axis being then measured not to the vertical but to the horizontal plane.

It will thus be seen that in all cases of oblique photography there is an advantage, as regards good utilisation of the corrected image, in the use of cameras in which the lens is decentred from above downwards, the use of too oblique pencils being thus avoided.

II. SPECIAL CASES.

§ 12. *The Principal Point of the Negative is kept on the Optical Axis.*—In certain cases it may be of advantage to avoid the somewhat delicate adjustment of decentring by taking steps to keep the principal central point of the negative on the optical axis of the correcting lens.

The conditions [A] and [C] worked out for the general case then apply without alteration, but condition [B], since $d = o$, becomes

$$\cos \beta = \cos \alpha \cos \omega$$

but it is preferable to substitute for this latter the condition

$$\sin \alpha = \frac{m}{n} \tan \omega \qquad [B']$$

obtained by making $d = o$ in the equation [2] of paragraph 4.

Lastly, the condition [D] becomes identical with the condition [B′] above: in the special case under consideration the enlargement n on the optical axis becomes the same as the enlargement nP of the principal horizontal, and, therefore, the equivalent focal distance of the corrected image is

$$F' = N\,H = n\,F \cos \omega$$

a value which, by introduction into equation [D], renders this latter identical with [B′].

The equation [C] of non-deformation, in this special case, can be expressed in another form, better adapted to the discussion of conditions of possibility. For this purpose we eliminate from this equation and from [A] and [B] either α and ω, or α and β, or β and ω.

Taking, as already done in paragraph 5,

$$k = \frac{S\ H}{O\ H} = \frac{\sin \beta}{m \sin \omega}$$

we obtain after elimination and simplification [7]

$$k = \sqrt{\frac{1 + \tan^2 \beta \left(\frac{1}{n^2} + \frac{1}{m}\right)}{1 + \tan^2 \beta}} = \sqrt{\frac{1 + \tan^2 \omega}{1 + m^2 \tan^2 \omega \left(1 - \frac{1}{n^2}\right)}}$$

$$= \sqrt{\frac{m^2 + (m^2 + n^2) \tan^2 \alpha}{m^2 (1 + n^2 \tan^2 \alpha)}}$$

whence it is seen that the necessary condition that $k = 1$ is

$$\frac{1}{n^2} + \frac{1}{m^2} = 1 \quad [C^a]$$

This condition necessarily implies

$$n > 1 \text{ and } m > 1$$

Thus, when the principal horizontal of the negative is brought on to the optical axis, correction without deformation is possible only by enlarging and by using a lens of focal length greater than that of the taking lens.

For each value of m, determined by the choice of the correcting lens, there is a corresponding value of the enlargement n such that

$$n = \frac{m}{\sqrt{m^2 - 1}}$$

A curve (fig. 11) can be constructed in accordance with this relation, and the required value of n readily ascertained for any given value of m.

---

[7] We will confine ourselves to carrying out the calculation in the single case where the angle α and ω are eliminated. The relations between the trigonometric lines of the same arc, viz.:—

$$\sin^2 \omega = \frac{\tan^2 \omega}{1 + \tan^2 \omega}, \quad \text{and} \quad \alpha = \sin^2 \beta =$$

allow us to write the condition (B′) as:—

$$\sin^2 \omega = \frac{\frac{n^2}{m^2} \sin^2 \alpha}{1 + \frac{n^2}{m^2} \sin^2 \alpha} = \frac{n^2 \frac{\tan^2 \alpha}{1 + \tan^2 \alpha}}{m^2 + n^2 \frac{\tan^2 \alpha}{1 + \tan^2 \alpha}}$$

If now the values of $\sin \omega$ and $\sin \beta$ are inserted into the expression for k, we have

$$k^2 = \frac{\frac{\tan^2 \beta}{1 + \tan^2 \beta}}{\frac{n^2 \frac{\tan^2 \alpha}{1 + \tan^2 \alpha}}{m^2 + n^2 \frac{\tan^2 \alpha}{1 + \tan^2 \alpha}}} = \frac{\frac{\tan^2 \beta}{1 + \tan^2 \beta} \left(m^2 + n^2 \frac{\tan^2 \alpha}{1 + \tan^2 \alpha}\right)}{m^2 n^2 \frac{\tan^2 \alpha}{1 + \tan^2 \alpha}}$$

Lastly, expressing $\tan \alpha$ in terms of $\tan \beta$ according to equation (A)

$$k^2 = \frac{\tan^2 \beta \left[m^2 (n^2 + \tan^2 \beta) + n^2 \tan^2 \beta\right]}{m^2 n^2 \tan^2 \beta (1 + \tan^2 \beta)} = \frac{1 + \tan^2 \beta \left(\frac{1}{n^2} + \frac{1}{m}\right)}{1 + \tan^2 \beta}$$

For a given value of the enlargement n measured along the optical axis the total length PP′ of the correction camera is given by

$$L = \left(2 + n + \frac{1}{n}\right) f$$

Substituting for f its value mF and for n its value from equation [1] we obtain

$$L = \left(2 + \frac{m}{\sqrt{m^2 - 1}} + \frac{\sqrt{m^2 - 1}}{m}\right) m F$$

$$= F \frac{m\sqrt{m^2 - 1} + m^2 + (m^2 - 1)}{\sqrt{m^2 - 1}}$$

$$L = F \frac{(m + \sqrt{m^2 - 1})^2}{\sqrt{m^2 - 1}}$$

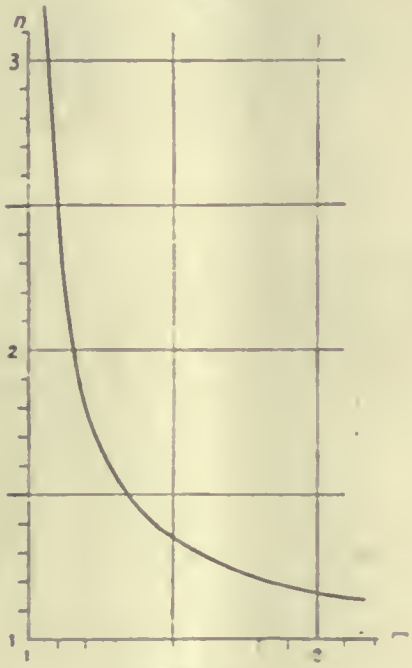


Fig. 11.

In constructing the curve (fig. 12), which gives the different values of L : F in terms of m, it is seen that this curve exhibits a very marked minimum for the value of m equal to $\sqrt{\frac{2}{3}}$ with which correspond the values

$$m = 1.154 \qquad L = 5.194F \qquad n = 2.006$$

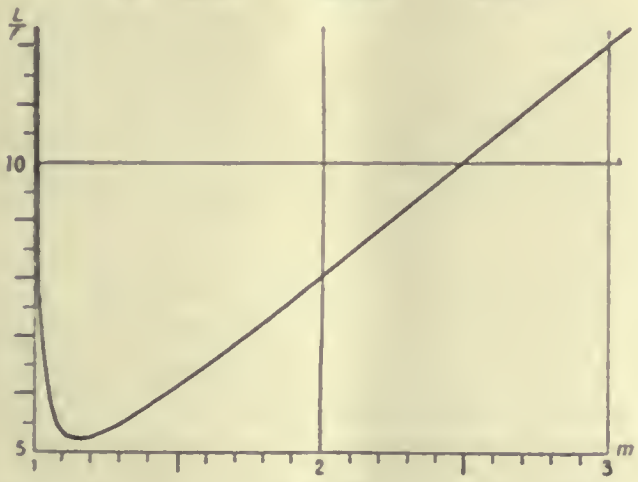


Fig. 12.

When the correction camera is intended for the rectification of negatives made with taking cameras fitted with lens of focal length F, it is advisable, as a means of reducing the bulk of the correction camera, to select a lens of focal length f (and of corresponding value of m) such that L is a minimum.

Among the regular cameras of the French Army Aviation Service, that which by the extent of its field is best adapted for cartographic work is the so-called 0.26, in which the focal length is between 25 and 27 cm.

In adopting for the correction camera a lens of focal length

$$0.26 \times 1.154 = 0.300 \text{ metre (30 cm.)}$$

the minimum length of the correcting camera will be

$$L = 5.194 \times 0.26 = 1.350 \text{ metre.}$$

In the case where the focal length of the lens of the taking camera exceeds one of the limiting values, the values of m, n and L would become

$$F = 0{\cdot}25 \quad m = \frac{{\cdot}30}{{\cdot}25} = 1{\cdot}2 \quad n = 1{\cdot}83 \quad L = 1{\cdot}36 \text{ metres}$$

$$F = 0{\cdot}27 \quad m = \frac{{\cdot}30}{{\cdot}27} = 1{\cdot}1 \quad n = 2{\cdot}33 \quad L = 1{\cdot}45 \quad ,,$$

Under these conditions correction without deformation is assured by the use of a correcting camera of extension, such as to permit of a variation of enlargement n within the limits 1.75 to 2.45.

A greater range can, however, be of service for the purpose of subsequently bringing the corrected image to any required scale.

As in the general case, the condition [B] allows of fixing the limiting values of the angle ω corresponding to the practical limiting values imposed on β. Taking 30° as a maximum for β, the limiting values of the angle ω corresponding with different values of m previously contemplated are:—

m	1.1	1.175	1.2
ω	27°	25°	24.3°

In the case where the principal point of the horizon is kept on the optical axis, the angles α and β can be constructed graphically (fig. 13). On the optical axis O F, O being the optical centre and F the rear focus of the correction camera, draw a perpendicular at F, and with O as centre describe an arc of a circle of radius O H = F/sin ω, which determines the point H. From this point describe

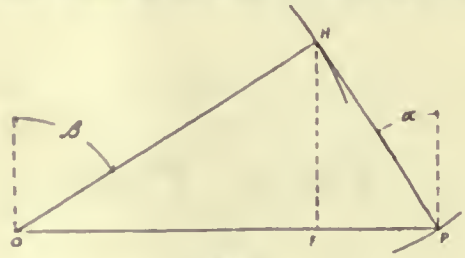


Fig. 13.

the arc of a circle of radius H P = F cot ω, which fixes the position of P on O F produced.

§13. *Enlargement on the Axis is Constant and Equal to Unity.*—When $n = 1$, the conditions worked out for the general case become

$$\tan\alpha = \tan\beta \text{ whence } \alpha = \beta$$

$$e\frac{d}{\cos\alpha} = F\frac{\cos\alpha\,(1 - \cos\omega)}{\sin\omega\cos\alpha} = F\frac{1 - \cos\omega}{\sin\omega} = F\tan\frac{\omega}{2}$$

$$\sin\alpha = m\sin\omega$$

$$F' = N\,H = f\frac{\sin\omega}{\sin\alpha} = f\frac{\sin\omega}{m\sin\omega} = \frac{f}{m} = F$$

It is thus seen that in these conditions the system is constantly symmetrical in respect to the plane, perpendicular to the optical axis, in which is the optical centre, whence result certain facilities for the automatic operation (in conjunction) of the two rocking frames. In this case also it is to be noted that the corrected image is on the same scale as that which would have been photographed directly from the same view-point with the same lens on a horizontal plate (or on a vertical plate in the case of correction of an image taken on an, approximately, vertical plate).

Moreover, if $m = 1$, that is to say if we employ for the correction camera the lens used on the taking camera or a lens of the same focal length, the conditions of adjustment become

$$\sin\alpha = \sin\omega, \text{ whence } \alpha = \beta = \omega$$

$$d = F\frac{1 - \cos\omega}{\tan\omega} \text{ or } e = F\frac{1 - \cos\omega}{\sin\omega} = F\tan\frac{\omega}{2}$$

The decentering would then depend on a single parameter, the angle ω which is at the same time the angle of the rocking frame, and it is then possible to operate the movements of tilting and decentering in a strictly mechanical way by means of a suitably formed cam.

We could bring within the scope of this last method the correction of negatives taken with a lens of any focal length, longer or shorter than that of the correction lens, by making the corrected negative not from a contact transparency of the original negative, but from a transparency reduced or enlarged upon a scale m, such that it is identical with one made with a lens of equivalent focal length equal to that of the correcting lens.

§ 14. *Correction Lens has the Same Focal Length as Taking Lens.*—By making $m = 1$, the conditions of correction become

$$\sin \beta = \sin \omega, \text{ whence } \beta = \omega$$

$$\tan \omega = n \tan \alpha$$

$$d = F \frac{1 - \cos \alpha}{\tan \omega} = F \frac{1 - \cos \alpha}{n \tan \alpha} \text{ or } e = F \frac{1 - \cos \alpha}{n \sin \alpha} = \frac{F}{n} \tan \frac{\alpha}{2}$$

$$\sin \alpha = \frac{F}{F'} \sin$$

If also $n = 1$, the case becomes that studied in the preceding paragraph.

We could also, by the same artifice of previous change of the scale, carry out the correction without decentering. This would be done by making a positive transparency reduced to the scale of $1/m$, and then correcting by enlarging on the scale n, such that

$$\frac{1}{m^2} + \frac{1}{n^2} = 1$$

The ratio n/m being thus susceptible of being chosen arbitrarily, we could adopt for it a value such that we can arrange as we like the scale of the corrected photograph. Denoting, as already done, the equivalent focal length of the correction camera-lens by F′ and the focal length of the taking lens as F/m, we have

$$\frac{n}{m} = \frac{F'}{F \cos \omega}$$

L. P. Clerc.

(To be continued.)

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Roll-Film Developing.—No. 17,419. Photographic roll-film developing apparatus. M. Chakir.

Cameras.—No. 17,454. Cameras. P. K. Esdaile.

Projection Screens.—No. 17,116. Screens for reception and exposure of cinematograph pictures. W. Lawrence.

Stereoscopic Projection.—No. 17,394. Optical projection of stereoscopic pictures. A. K. and J. G. Maxwell.

Film Cement.—No. 17,376. Film cement. E. Bullock and J. A. Chalmers.

Cinematography.—No. 17,244. Apparatus for cinematograph projection. Carey-Gavey Syndicate and K. Higginson.

COMPLETE SPECIFICATIONS ACCEPTED,

These specifications are obtainable, price 6d. each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

Triplet Large-Aperture Lenses.—No. 127,058 (April 19, 1917). The invention relates to optical lens combinations comprising compound or achromatic lenses, whereby spherical aberration is more or less avoided, thereby obtaining a lens suitable for use in microscopes, telescopes, and chiefly for photographic purposes. The main object is to obtain a very large aperture relatively to the equivalent focal length consistently with either total freedom from spherical aberration, or else a normal degree of spherical aberration whether over or under corrected.

It is found that a triple combination consisting of one double convex positive lens of low refractive index enclosed between and optically united to or cemented to two meniscus negative lenses of very high refractive index and approximately equal power gives a more perfect uniformity in its spherical aberration correction throughout its aperture than any other combination, so that a clear working aperture equal to at least one-third of the equivalent focal length is easily obtainable consistently with perfect correction for spherical aberration, that is, the spherical aberration of the third order is practically eliminated. For instance, the following combination may be cited:—

Crown glass refractive index for D-ray = 1·5216
Reciprocal value of dispersive power (C to F) = 50 to 51
Flint lenses refractive index for D-ray = 1·694
Reciprocal value of dispersive power for D-ray (C to F) = 31
Radii of curves in the order that the light passes through them
+ means convex.
− sign means concave.

L_1	L_2	L_3
+ 2·5 − 1·25	+ 1·25 + 1·095	− 1·095 + 1·94
t_1 = ·125	t_2 = ·32	t_3 = ·125

where t is thickness of lens.

Diameter (D) = 1·10 inch, equivalent focal length = 3·01 inch.

These lenses, when cemented together, yield an achromatic objective which is free from spherical aberration for a pencil of rays diverging from a point on the axis about 11 ins. away from the first surface.

The curves can also be arranged for giving perfect correction against spherical aberration when the first surface is presented to parallel rays. In such a form the combination may be advantageously used for the objective of a Galilean telescope wherein a large relative aperture is necessary for securing a large field of view. It is also obvious that two such triple lenses can be placed near together in the same axis for forming a still more powerful combination whose aperture will be nearly two-thirds of its equivalent focal length, a combination highly desirable for rapid photography or for cinematograph projection.

It then becomes important to introduce such modifications to the curves so that a fairly flat image is produced. If this is done in the triple objectives themselves, then it is well known that all that can be done is to secure that the image of a series of circles concentric with the axis shall be flat, while the image simultaneously formed of radial lines passing through the axis will remain curved concave to the lenses and approximately to a radius equal to 2¼ times the equivalent focal length.

But it is very questionable whether this condition can be fulfilled without resorting to an impracticably large separation between the two triple positive lenses.

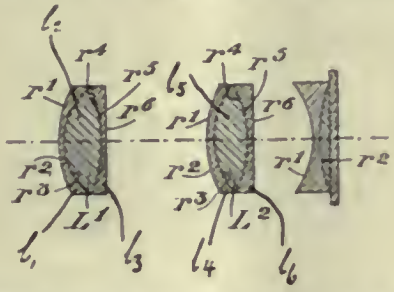
Should it be necessary to get the latter image flat as well as the former, then a further auxiliary device is used, which consists in placing a negative correcting lens in, or almost in, the plane of the image formed by the above positive combination, and having its principal focal length about equal to that of the positive combination above described. If this correcting lens be concavo-plane, the real image should be formed on or just beyond its second or plane surface, where the photographic plate should be placed to receive the image.

It can be shown that if a flat and anastigmatic image be thrown by any positive lens on the left into the above negative lens on the right in the manner described, then the negative lens will impress upon it an anastigmatic curvature, and will convert it from a flat anastigmatic image into a curved anastigmatic image whose radius of curvature is n times the principal focal length of the negative lens and curved concave towards the right or convex towards the positive combination on the left. The above term n denotes the refractive index of the negative lens.

It can then be arranged for the positive combination of one or two triples to be so corrected as to yield a curved anastigmatic image whose radius of curvature will also be roughly about 1.4 to 1.5 times the combined focal length of the positive combination and curved concave to the latter. If the negative lenses in the focal plane is of about equal power to the positive combination, then it follows that the curvatures of the two images yielded by the positive projecting lens and the negative corrector lens in the

focus on the other hand will neutralise each other, resulting in a flat and also anastigmatic final image or field of view.

The shape of the negative lens, while only slightly affecting this relationship, can at the same time be so arranged as to give no distortion or departure from rectilinearity of the images of straight lines. Thus, if it be a simple negative lens having a refractive index of 1.5, then the radius of curvature of the



second concave surface should be four times that of the first concave surface.

Should the negative corrector lens be concavo-plane, then it will give slight positive distortion of straight lines, amounting to about 2 *per cent.* at a distance from the axis equal to one-fourth of its focal length.

The following are the glasses, curves, and other data for a flat-field anastigmatic lens of an aperture equal to about half of its equivalent focal length, which is about 2.21 ins. The combination is shown in the accompanying drawing:—

Lenses l_1 and l_4 are of dense barium crown glass having

$$N_D = 1{\cdot}6237 \text{ and } \frac{N_D - 1}{N_F - N_C} = 44{\cdot}9$$

Lenses l_2 and l_5 are of highly dispersive crown glass having

$$N_D = 1{\cdot}5216 \text{ and } \frac{N_D - 1}{N_F - N_C} = 51{\cdot}1$$

Lenses l_3 and l_6 are of extra dense flint glass having

$$N_D = 1{\cdot}694 \text{ and } \frac{N_D - 1}{N_F - N_C} = 31{\cdot}0.$$

The − signs indicate concave surfaces.

RADII OF CURVES.

L_1 l_1: $r_1 = 1.30$, $r_2 - {\cdot}7725$ — Central thickness = ·07

L_1 l_2: $r_3 + {\cdot}7725$, $r_4 + 1{\cdot}65$ — Central thickness = ·385

L_1 l_3: $r_5 - 1.65$, $r_6 + 9{\cdot}8$ — Central thickness = ·08

Finished diameters = 1·13

D

L_2 l_4: $r_1 + 1{\cdot}339$, $r_2 - {\cdot}802$ — Central thickness = ·08

L_2 l_5: $r_3 + {\cdot}802$, $r_4 + 1{\cdot}49$ — Central thickness = ·385

L_2 l_6: $r_5 - 1{\cdot}49$, $r_6 + 8{\cdot}75$ — Central thickness ·08

Finished diameter = ·13.

Negative corrector lens of 1·37" focal length of fluor crown glass having $N_D = 1{\cdot}4785$. In order to fulfil the Petzval condition it is desirable to employ a glass of low refraction for the negative corrector lens.

L_3: Curves $r_1 = -1{\cdot}00$ in., Radii $r_2 = -1{\cdot}925$ in. — Central thickness = ·03

Finished diameter 1·20 in.

Clear aperture of 2nd surface = 1·15.

This combination yields a flat and almost anastigmatic image over a field of 20 degs. diameter.

When assembling this lens, it must be remembered that the focal plane for distant objects lies in the plane of the back edge of the second surface of the corrector lens, which is left of 1.15 ins. diameter across edges of polished surface.

For a focussing screen a disc of parallel flat glass greyed on one side should therefore be placed with its greyed surface up in contact with the back edge of the corrector lens, and the two compound lenses L_1 and L_2 be adjusted to project the image sharply upon this focussing screen. Then, if desired, the screen can be removed and the images of a distant point of light can then be observed through a powerful achromatic magnifier of at most .25 focal length and .125 aperture, used as an eyepiece.

The image when thrown near the edge of the negative corrector should be examined for coma. If there is marked inward coma, then L_1 and L_2 want screwing nearer together. If there is outward coma, L_1 and L_2 want screwing further apart.

It may be that glasses cannot be obtained very exactly to the above specification, and therefore the results deviate somewhat from the normal.

The spherical aberration of L_1 used alone and when focussing an image of a distant point of light should be fairly well corrected, showing a tendency to a slight zone of aberration, the rays about half-way between centre and edge having the shortest focus. If it appears over-corrected for aberration, then the first radius may be deepened with advantage; but this will produce a little inward coma at the foci of oblique rays, and L_1 and L_2 will have to be brought nearer together. This will slightly shorten the axial focal length.

Although the axial focal image of a distant point of light formed by this lens at aperture f/2 cannot be said to be entirely free from a zone of aberration, yet it is a mere fraction of what is found at the axial focus of a petzval portrait lens or any other lens having anything approaching the large relative aperture in question.

It is also quite possible to employ one compound positive lens substantially like the L_1 above specified, which is characterised by a large amount of inward coma and place a stop behind it at a distance equal to about a quarter or one-third of its focal length, which, by its selective effect, may cause the image projected by L_1 to be fairly anastigmatic, and this image may be projected to the rear side of a negative corrector lens of a focal length approximately equal to that of the said positive lens, and by whose action the curved anastigmatic image may be flattened; but this method does not admit of so large a relative aperture. Alfred Taylor, of Messrs. T. Cooke and Sons, Limited, Buckingham Works, Bishophill, York, and Harold Dennis Taylor, Buckingham Works, Bishophill, York.

Trade Names and Marks.

APPLICATIONS FOR REGISTRATION.

KINEPARTS.—No. 386,864. Cinematograph apparatus. Thomas Linforth Jones, 10, Ham Yard, London, W.1; cinematograph and general instrument maker and repairer. December 14, 1918.

FORTHCOMING EXHIBITIONS.

September 13 to October 11.—London Salon of Photography. Entries close September 2. Hon. sec., 5a, Pall Mall East, London, S.W.1.

October 13 to November 29.—Royal Photographic Society. Secretary, J. McIntosh, 35, Russell Square, W.C.1.

SOLDIERS' PHOTOGRAPHS OF THE KING AND QUEEN.—During one of the intervals in the procession on Saturday last, July 19, an Australian soldier stepped out from the crowd near the Royal Pavilion and prepared to take a photograph of the King and Queen. Their Majesties (reports the "Times") noticed the soldier's preparations, and smilingly stood while the photograph was taken. With a salute the soldier stepped back. Prompted by his success other soldiers with cameras and several civilian amateur photographers to the number of between twenty and thirty also came forward, and again their Majesties acquiesced.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

SATURDAY, JULY 26.

Chelsea Photographic Society. Outing to Denham.
Hackney Photographic Society. Outing to Rickmansworth.

SUNDAY, JULY 27.

South London Photographic Society. Excursion to Beckenham and District.

TUESDAY, JULY 29.

Hackney Photographic Society. "Mounting Prints." By Four Members.

PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

A MEETING of the Council was held on Friday, July 11, 1919. Present: Messrs. Basil, Chapman, Gordon Chase, Corbett, Dickinson, Ellis, Fry, Gray, Haines, Speaight, and Wakefield (London members), and Marcus Adams (Reading), Beaufort (Birmingham), Chidley (Chester), Illingworth (Northampton), Read (Southport), Spink (Brighton), and Turner (Hull).

The minutes of the previous meeting were read and confirmed.

The Hon. Sec. reported that he had received an average number of business communications from members during the month, and that most of them had been dealt with by return of post; the remainder after consultation. A member had sought the opinion of the Council in regard to his charges for attending (time taken 12½ hours), making three whole-plate negatives at a factory under difficult circumstances, supplying twenty-four mounted prints, and delivering the negatives. His charge was six guineas, and exception had been taken to it. The Council took the view that the charges were reasonable, and instructed the Hon. Sec. to write the member to that effect.

Another inquiry was put by a member, viz.: "A professional photographer is asked to attend and photograph a wedding group. The local illustrated paper also asks permission to attend and photograph for their paper. Can the professional photographer complain if the paper sends proofs and canvasses for orders?"

Mr. Turner stated that a great amount of this kind of business arose in country areas, and that an agreement was generally made between the newspapers and the professional photographer on the following lines:—The photographer to supply a photograph for publication in the paper (with or without charge), the photographer's name appearing under the illustration. The newspaper thus obtains its photograph with licence to reproduce in one issue only without having to incur the expense of sending an operator; the photographer obtains an advertisement, and retains his interest in the purely photographic part of the business. The Hon. Sec. was instructed to write the member to this effect.

Complaint was received from a member that a local schoolmaster, an amateur, was attending public and semi-public functions nominally for press purposes, subsequently supplying photographs at very cheap rates. This practice was commenced when the member and other professional photographers in the same town were on war service, and was being continued to their great annoyance and loss now that they had returned to their business occupations. The Hon. Sec. was instructed to obtain further information as to the status of the schoolmaster, and to ascertain who were his employers.

Complaint was received from a member who stated that a firm of dealers had refused to continue to supply certain goods on "dealers' terms." The matter had been investigated, and it was obvious that the member had a claim either for a continuation of the old terms, or for a credit for his unsold stock. The council authorised the continuation of the negotiations so as to secure the best possible arrangement for the member in question. One of the difficulties in the matter was that dealers and manufacturers had no stock of the kind required which could be supplied. The Hon. Sec. stated that he had little doubt but that the dealing firm in question would settle the matter quite equitably with their member.

The Hon. Sec. reported that a new edition of the Handbook, with added matter of a useful character, and revised and brought up to date by Mr. Mackie, was being prepared, and would be ready for issue towards the end of the year.

Mr. Read proposed that all nominations of new members should come before the Council for election. It was pointed out that, as the Council meetings were held at intervals of one month, this suggestion would involve considerable delay, which might easily prejudice the Association. It was further argued that a professional photographer, who came within the four corners of the membership rule, had practically an inherent right to become a member, and that any possible veto, possessed by the Council under Rule 4, was on the ground of eligibility only.

The matter of the incorporation of the P.P.A. was further adjourned, in order that opportunity might be given for ascertaining the full import of the advantages claimed for the proposed action. Two members of the Council were specially instructed to inquire, and, if possible, ascertain the effect of incorporation upon future official relations of the Association with Government Departments. The matter of the Association's financial position was discussed intimately, and the general effect likely to be caused by a change in the legal status of the Association considered in its several aspects. Some other matters dependent upon this decision were also adjourned.

The Hon. Sec. was authorised to join the Industrial Reconstruction Council.

Mr. Chidley reported that he had investigated on the spot the complaint of one member that another, practising professional photography in the same town, was showing specimens which were not his own work. Mr. Chidley stated that the photographer was personally known to himself and Mr. Illingworth, and he was quite satisfied that the specimens were being properly exhibited. Some of them were made when the photographer whose action was complained about was in the service of an employer, and a letter from that employer was shown to Mr. Chidley authorising the use of the photographs. The Council, therefore, found themselves in the happy position of being able to reassure both the members in question.

It was reported that certain firms undertook to supply specimens for photographers who were newly entering the profession, and this practice the Council considered to be reprehensible and quite unprofessional. The Hon. Sec. was instructed to get such information as he could and report upon the matter to the next meeting of Council, which was fixed for the second Friday (10th) in October, the recess intervening.

CROYDON CAMERA CLUB.

DR. F. KNOTT read a most thoughtful paper on "Memory Systems, Past and Present," with agreeable succinctness, clearly describing the evolution of artificial aids to memory, so much advertised in recent times, but unhappily never adopted by the not uncommon individual who so frequently finds himself divorced from loose cash, and regards his suffering friends as a happy media for reunion.

Granted that many things occur in life for which a system compelling forgetfulness would be extremely useful, yet what is more aggravating than to endeavour vainly to recall some familiar name, or, perhaps, fact, which has stuck in the sub-consciousness and refuses to traverse the mysterious connecting link with the consciousness. Again, think of the value of any system which would allow one to store mentally such charming articles as "The Photographic Correction of Negatives Taken Obliquely," which recently appeared in the "B.J.," and dish them up from memory in the future for the edification of astounded friends. And this quite apart from the £.s.d. point of view, which, according to the advertisements, is highly attractive, not to mention the potential acquirement of high office in many directions.

The lecturer just gave an outline of the various systems proposed from time to time, the first being before the Christian era, and then passed on to a detailed examination. On one point he was emphatic, namely, that modern systems are but variations of the old, and possess no essential elements of novelty, despite strong allegations to the contrary. A discussion followed the paper during which the doctor said he had found mnemonics most useful in remembering data. A most cordial vote of thanks was accorded for a lecture which raised many points of real interest.

LANCASHIRE SOCIETY OF MASTER PHOTOGRAPHERS.

A very largely attended meeting was held at the office, 39, Blackfriars Street, Manchester, on Tuesday, July 15, 1919, Mr. Fred Kenworthy presiding. A great deal of correspondence having been dealt with, it was decided, after considering applications for membership, to form a sub-committee to deal with all such proposals and to report, after making inquiries, into the standing of the photographers of the profession, as it was thought necessary that at this stage of the society's progress it was advisable to consider very carefully all future applications for membership.

A very lengthy discussion took place on the quality of paper being supplied at present by various manufacturers, it being pointed out by several members that the paper was very inferior in quality and caused a great deal of loss to the photographers in consequence. It was the general expression of opinion that during the war there was every excuse for this, and the members considered that the time had arrived for photographers to co-operate together and insist upon a better quality of material being supplied to them. After the matter had been very fully discussed, the secretary was instructed to get in touch with the members of the society and ask them to send in their comments on this very important subject.

It was decided to hold the next meeting at Southport on a date to be arranged later. It was suggested that at this meeting a series of papers should be given by various members.

After other detail work had been dealt with, a vote of thanks was proposed to the chairman, and the business of the meeting terminated.

Commercial & Legal Intelligence.

LOUVRE STUDIOS, LIMITED.—The Official Receiver, in the High Court of Justice, has now issued his report under the liquidation of the Louvre Studios, Limited, of 127, Earl's Court Road, Earl's Court, S.W.5. The gross liabilities as regards creditors amount to £2,301 9s. 3d. The assets consisting of stock-in-trade are returned at £100, thus leaving a deficiency of £2,201 9s. 3d. The paid-up capital of the company is £100, to which has to be added the above deficiency of £2,201 9s. 3d., making the total deficiency £2,301 9s. 3d. The Official Receiver's report upon the case is to the following effect:—The winding-up order was made on March 18, 1919, upon the petition of a creditor. The company was registered on December 22, 1917, as a private company with a nominal capital of £100, divided into ninety-five Ordinary shares and five Preference shares of £1 each. Its objects were to carry on business as photographers, etc. The company was promoted by J. St. L. Stallwood and Miss H. B. Taylour. In March, 1918, it purchased from one, Matthew Kelly, the business of a miniature dealer, carried on by him at 127, Earl's Court Road, known as "The King Edward Studios." The company continued the business at that address, and also carried it on at 171a, Sloane Street, W. The consideration for the purchase was the payment of £400 in cash, the issue of £600 of debentures of the company in twelve debentures of £50 each, and the allotment of twenty-four Ordinary Shares. By the terms of the agreement the debentures and shares were issued to the vendor's nominee, and the vendor further covenanted not to trade as a miniature dealer. The directors of the company were Miss H. B. Taylour, Mrs. M. C. Lang, E. C. Dyer, and Matthew Kelly. Kelly was the only director at the winding-up. Ninety-five ordinary and three preference shares were allotted to Miss H. B. Taylour as fully-paid under an agreement for services rendered. In addition to the £600 of debentures issued as above mentioned, twelve debentures of £50 each, carrying interest at 12½ per cent., were issued to six persons on March 13 and 25, 1918, purporting to be for cash, but on September 6, 1918, owing to the unsatisfactory state of the company, Kelly required greater security, and it was decided that satisfaction for the debentures other than those issued to himself be entered up at Somerset House, the holders to rank as unsecured creditors. On May 2s, 1918, Miss Taylour resigned from the managing directorship, and on July 31, 1918, Kelly became managing director. The books of the company have been very imperfectly kept, and the information supplied as to its business affairs is defective. The failure of the company is attributed by Kelly to mismanagement through a lack of knowledge of the business on the part of the purchasers.

LEIGH MANUFACTURERS' AFFAIRS.—At the offices of the Official Receiver for the Chelmsford District, Bedford Row, W.C., last week, the first meeting of creditors was held under the failure *re* Peter Morrison, of Henry's Hall, Leigh-on-Sea, and also under the failure of his brother Thomas Morrison, of Henry's Hall, and the Laurels, Chalkwell Park Drive, Leigh-on-Sea.

The statement of affairs filed by Peter Morrison showed gross liabilities amounting to £2,822 11s. 1d., of which £1,122 11s. 1d. was expected to rank against the estate for dividend. The assets consisted of a bad debt of £251 15s., which was estimated to be of no value. The deficiency was returned at £1,122 11s. 1d. The debtor alleged his failure to have been caused through unsuccessful investment in company, and costs of litigation.

The Official Receiver's observations on the case are as follows:—The receiving order was made on the petition of creditors, the act of bankruptcy being the failure of the debtor to comply with the requirements of a bankruptcy notice. The debtor, aged forty-four, stated that he was a solicitor and had carried on business in Castle Street, Edinburgh, until April, 1916. He then had to relinquish his practice owing to ill-health and went to live at Southend-on-Sea.

In or about May, 1915, he, in conjunction with his brother, raised the sum of £350 for the purpose of completing the purchase of the machinery and plant of a photographic paper manufactory at Leigh-on-Sea, which another person had agreed to purchase for £550. Upon the completion of the purchase, he and his brother took possession of the business and carried it on under the name of the Leigh Photographic Paper Co.

In September, 1916, a company was floated under the name of the Leigh Photographic Paper Company, Ltd., and the business was transferred to the company for £4,000, to be satisfied by the allotment of shares to him and his brother or their nominees. The sum of £4,000 was raised on the security of debentures of the company, and the debtor and his brother charged their interest under the will of their father further to secure this sum. In February, 1918, the name of the company was changed to Essex Photographics, Ltd. The business was carried on under the direction of the debtor and others until June, 1918, when a debenture-holder's action was commenced and a receiver was appointed.

Proceedings were taken to recover the lease which was in the name of the gentleman above, and an order was made directing that the lease be transferred to the company upon certain terms, and the debtor and his brother were ordered to pay the costs.

On the debenture-holder's action the Receiver made application to the Court for leave to close the business, which application the debtor opposed, and the Court ordered the business could be kept open if the debtor provided the necessary funds to continue it. For this purpose he, in conjunction with his brother, borrowed £200 from the petitioning creditor, but did not pay the amount to the receiver within the time fixed by the Court, and the business was closed. The money was used in payment of certain accounts. The instalments became in arrear, and these proceedings followed.

The unsecured indebtedness is stated to be due as to £275 damages and costs for wrongful dismissal. As to £200 overdraft at the bank. As to £260 to the petitioning creditor for money lent. As to £100 to a relative for money lent, and as to £37 11s. 1d. for solicitor's costs.

The security held by the creditors scheduled as fully secured consists of the debtor's reversionary interest under the will of his late father and the creditor scheduled as partly secured holds a second charge on the same reversion. The contingent liability is an overdraft on the account of the company at their bank, which was guaranteed by the debtor. The debt due to the estate consists of wages and directors' fees, which at present there is no prospect of recovering.

The debtor is a bachelor and has no household furniture.

The debtor has not been adjudged bankrupt, and states that he is considering making a proposition to the creditors, but no proposal has yet been lodged with me. The debtor states that he first

became aware of insolvency in June, 1918, when the receiver for debenture holders was appointed.

In regard to the failure of Thomas Morrison, the statement of affairs filed by the debtor showed gross liabilities amounting to £2,727 11s. 1d., of which £125 was expected to rank against the estate for dividend. The assets consisted of a bad debt of £199 15s., estimated to be of no value, thus leaving a deficiency of £1,012 17s. 1d.

The Official Receiver's report upon this case is to the following effect:—The receiving order was made on the petition of creditors, the act of bankruptcy being the failure of the debtor to comply with the requirements of a bankruptcy notice before December 15, 1918. The debtor, who is forty-two years of age, states that for about six years prior to May, 1915, he had carried on business as a photographer in Edinburgh. In or about May, 1915, he arranged with a gentleman who had agreed to purchase the machinery and plant of a photographic paper manufactory at Leigh-on-Sea for about £550 to provide the money required to complete the purchase. He sold his business at Edinburgh for £200, and in conjunction with his brother borrowed a further sum of £350. With these sums the purchase was completed, and he and his brother took possession of the business and carried it on under the name of the Leigh Photographic Paper Company.

Eventually, as there was not a quorum of creditors present it was decided to leave the estates in the hands of the Official Receiver, who intimated that if the directors were able to offer a composition to their creditors he would be pleased to consider it.

Legal Notices.—Notices of intended dividends are given as regards the following failures:—(1) Alfred Ernest Priest, photographer, 21a, Prince of Wales Road, Norwich, and residing at 51, Sprowston Road, Norwich. (2) Harry Saville Thorne, chemist and photographer, 5, Finkle Street, Selby, lately residing at 98, Sackville Street, Barnsley, afterwards at 5, Finkle Street, and 26, Finkle Street, Selby.

Dissolution of Partnership.—Notice is given of the dissolution of partnership between George Bushell and John Kemp Pritchard, carrying on business as photographers at 11, Jewry Street, Winchester, under the style of Rider's Studio. All debts due to and owing by the firm will be received and paid by John Kemp Pritchard, who will continue to carry on the business.

NEW COMPANIES.

Derby Photo Works, Ltd.—This private company was registered on July 15, with a capital of £2,000, in £1 shares. Objects: To carry on at 92, St. Peter's Street, Derby, the business of photographers and cinematographers and dealers in photographic materials, etc. The subscribers (each with one share) are:—W. H. Hoare, 84, Kedleston Road, Derby, pharmacist; A. Hoare, 84, Kedleston Road, Derby, photographer. The first directors are W. H. Hoare and A. Hoare. Secretary and office: A. Hoare, 92, St. Peter's Street, Derby.

The Johnston Optical Co., Ltd.—This private company was registered on July 16, with a capital of £3,000 in £1 shares. Objects: Opticians, manufacturers of and dealers in photographic instruments and materials, etc. The subscribers (each with one share) are:—Miss A. M. Johnston, Fernbank, Etterby, Carlisle; F. Thompson, Rosslyn House, Carlisle, optician. Directors: H. V. Johnson, J. A. Johnson, Miss A. M. Johnston, F. Thompson, and W. O. Whitehead. Qualification 100 shares. Registered office: 9, Friars Court, Carlisle.

Home Cinema Camera Co., Ltd.—This private company was registered on July 12, with a capital of £2,000, in £1 shares. Objects: To acquire an invention known as the Home Cinema Camera, and to manufacture cameras, cinematographic apparatus, lenses, and photographic appliances. The subscribers (each with 500 shares) are:—A. Barnett, 94, Melrose Avenue, Cricklewood, N.W.2., agent; A. J. Simmons, 19, Cranfield Road, S.E.4, accountant; E. Esdaile, 65, Herne Hill, S.E.24, author. The first directors are A. Barnett, A. J. Simmons, and E. Esdaile. Solicitors: Radcliffe and Co., 32, Walbrook, E.C.4. Registered office: 3, Fulwood Place, Holborn, W.C.1.

Vitty and Seaborne, Ltd.—This private company was registered on July 14, with a capital of £3,000, in £1 shares. Objects: To adopt agreements (1) between C. P. Vitty and H. G. Seaborne, of the one part, and A. S. Bull, of the other part; and (2) between Bull, Austin, and Co., Ltd., of the one part, and A. S. Bull, of the other part, and to carry on the business of process engravers in line, halftone, and colour, wood and gravure engravers, printers, photo lithographers, photographers, enlargers, etc. The subscribers (each with one share) are:—C. P. Vitty, The Garth, Brampton Road, St. Albans, process engraver; H. G. Seaborne, Seaton House, Queen's Avenue, Watford, process engraver. The first directors are C. P. Vitty, H. G. Seaborne, and A. S. Bull. The two first-named are permanent managing directors. A. S. Bull is European Traffic Manager to the Sudan Government Railways. Registered office: 3, Crane Court, Fleet Street, E.C.

News and Notes.

Prepaid Advertisements.—Our publishers ask us to give prominence to the intimation that small advertisements are not accepted by telephone for appearance in the "B.J."

Bottle Shortage.—In consequence of the scarcity at the present time of wide-mouth bottles of size holding about 1lb., Messrs. Johnsons, of Cross Street, Finsbury, London, E.C., are asking their customers to return empty bottles of this size, and are offering three shillings per dozen for them sent carriage paid. Messrs. Johnsons inform us that the difficulty of obtaining bottles holding about 1lb. of developer is just now a cause of delay in executing orders.

"Sea Pie."—The laughs in the volume of "Sea Pie" now on sale on bookstalls and elsewhere are worth a great deal more than the 1s. 6d. which is charged, and the profits from which go to the King's Fund for Sailors. "Sea Pie" is produced by the officers of the Royal Naval Depot, Crystal Palace, whom every buyer of the book will thank for bringing within its covers a bounty of hearty humour, which is just in the key of the light-hearted holiday maker.

Secondhand Optical Instruments.—An 80-page catalogue just issued by Messrs. Charles Baker, 244, High Holborn, London, W.C.1., is a unique publication in the specifications it gives of all descriptions of scientific instruments offered second-hand. Microscopes and accessories therefor, are Messrs. Baker's leading line; but photographic and projection apparatus occupy some dozen pages. Messrs. Baker also hold stock of the materials for the Paget and Autochrome colour processes, and are glad to give demonstrations of these methods to those interested at the address given above.

Death of Mr. Walter D. Welford.—A once familiar figure in photographic journalism of the past disappears by the death of Mr. Walter D. Welford, sub-editor of "Photography" in the early days of that periodical. Mr. Welford, however, had not been connected with photographic journalism for many years past, although until within a few months of his death he was an active member of the staff of the "Kinematograph Weekly" and was writing cinema plays. In the literature of photography his name survives as that of the author of a manual on the hand camera, in the use of which, in the days before the popular vogue of the hand camera, he was an enthusiast.

View Postcards.—Photographers requiring view postcards from their own negatives and wishing to see the various styles of reproduction available cannot do better than apply to Messrs. Philip G. Hunt and Co., 332, Balham High Road, London, S.W.17, for a portfolio containing specimens of cards in the various styles supplied by Messrs. Hunt. Among real photographs these include the toned glossy, black and sepia, and black and sepia matt. Of photomechanical cards there are excellent specimens of collotype, photogravure and also of coloured cards in these processes. Messrs. Hunt also supply a photo-mechanical card in imitation of the glossy photograph. The portfolio contains some pages of explanatory notes on the originals for postcard printing and on the times required for executing orders in the various processes.

Ross Showcards.—It is impossible for anyone to charge Messrs. Ross, Limited, with neglecting to include the photographic dealer in their peace propaganda of lenses and cameras, for they have just issued a series of close upon a score of different showcards, some very strikingly conceived in colours, others consisting of artistically mounted photographs made with Ross lenses, and still others, exceedingly tasteful cards of about postcard size, such as can be used on a counter or in window dressing. We have been told that the British public will buy British lenses, if only lens makers bring them prominently to their notice. Beyond question, Messrs. Ross have taken most complete measures to collaborate with the dealers to this end. Any dealer who has not received a set of the showcards should apply to Messrs. Ross, Limited, North Side, Clapham, London, S.W.

Correspondence.

**** Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

**** We do not undertake responsibility for the opinions expressed by our correspondents.*

FLATTENING POSTCARDS OR PRINTS.

To the Editors.

Gentlemen,—As I frequently notice that according to the correspondence column of the "B.J." week by week many photographers are in difficulties over the curling of post-cards in drying, and you are constantly being asked for methods of straightening or flattening them, I thought I might be doing a good turn to my brethren in the profession if I described the method I always employ, which is quick, simple, easy and very efficient.

The method by which cards are taken before they are "bone dry" and put under pressure is not satisfactory, because it is uncertain. I have seen a batch of cards in pile taken from pressure by this method as solid as a block of wood, so firmly were they stuck together.

My course of procedure is as follows. After a thorough washing the cards are placed evenly one upon the other upon a sheet of plate glass and a roller squeegee run over them to remove superfluous water. They are then spread out upon sheets of Robond blotting paper and left to become quite dry (it is necessary for straightening that they be quite dry)

A clean sheet of brown paper is laid upon the bench upon which the flattening is to be done, the only other utensil required being a small piece of clean card-board about 6 ins. by 4 ins. (An old cabinet mount is just the thing).

The post-card is held by the left hand at one end face downwards upon the bench and the piece of card held in the right hand, being firmly pressed down on the back of the postcard. The postcard is then lifted vertically at the same time that the piece of card is drawn with firm pressure from left to right; this part of the process will be found to have flattened the half of the postcard operated upon. The other end of the postcard is then taken in the left hand and the process repeated with the other half. According as to whether the postcard be lifted straight up or bent back over the cardboard in the process so it can be either made flat or to curl slightly in a convex manner.

Care should be taken not to drag the postcard along the bench, thereby perhaps scratching the surface. All that is required is for the postcard to be lifted as the piece of flattening card is applied with sufficient pressure and drawn over the card towards the free end.

This method is thoroughly efficient, no matter how obstinately curled the postcards may have become in drying.

The same process may be employed for prints as well as for postcards.—Yours faithfully,

M. C. Millburn.

43, High Street, Aylesbury.

Answers to Correspondents.

SPECIAL NOTICE.

In consequence of general reduced supplies of paper, as the result of prohibition of the importation of much wood pulp and grass, a smaller space will be available until further notice for replies to correspondents.

Moreover, we will answer by post if stamped and addressed envelope is enclosed for reply: 5-cent. International Coupon, from readers abroad.

The full questions and answers will be printed only in the case of inquiries of general interest.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

J. W.—We have no knowledge of the firm. An English firm supplying certain sizes of ferrotype plates is the Quta Company, 252, Haydons Road, Wimbledon, London, S.W.

A. S.—The Order regarding new retail businesses has not been removed, but if the business of a photographic studio is confined purely to portraits, and does not include the selling of frames of any kind, no licence is required.

F. G.—In a studio the size you give, three 1,000 c.p lamps should be sufficient. If you apply to the General Electric Company, Ltd., 67, Queen Victoria Street, London, E.C., they will send you full particulars and prices of the half-watts.

J. M —We do not think you could have more detailed or practical instruction on making up developers, etc., than the article by Mr. Crabtree, which began to appear in the "B.J." of June 27 and was completed in the issue of July 18.

E. S.—The Al Vista camera was sold in this country by Messrs. Houghtons, who could probably furnish you with particulars. The price for the small size, 3½ by 9, was £4 4s.; 4 by 12, £5 5s.; 5 by 12, £6 6s.; and 5 by 16, £10 10s.; but the value now is not great.

N. and N.—Under the 1911 Copyright Act, which came into force July 1, 1912, registration is now no longer necessary for the purpose of establishing a legal claim to copyright. It is now recognised in law that the production of work such as a photograph creates the copyright in it.

J. H.—You will find an illustration and particulars of a daylight printing box in the "B.J." for March 30, 1917, which our publishers can still supply, price 4½d., post free. It will be difficult to use bromide paper on account of its rapidity, but you could manage well with gaslight paper.

P. A. W.—You can use acetylene light for enlarging most efficiently with a condenser, although it can be employed for illuminating the negative by reflected light. But a battery of acetylene burners for this purpose is rather awkward to arrange. Write to Messrs. R. J. Moss and Sons, 98, Snow Hill, Birmingham.

E. M.—We do not know of any firm which sells ebonite sheet in small quantities, but think your best plan would be to try one of the electrical supply firms, such as the Economica Electric Co., Twickenham, who supply all kinds of materials for amateur electrical work, and could no doubt obtain for you ebonite sheet if you send them a sample of your requirements.

F. T.—The only preparation made specially for reviving camera bellows is the Bertha reviver, which you can get for a shilling from any photographic dealer. Bookbinders use a book varnish for old corners, which might answer. Your lens appears to be a series IIIa No. 4, the list price of which was £5. It was the least satisfactory of any of the Zeiss anastigmats, and has long since been withdrawn.

M. L.—So far as we know there are no spectacles specially made for retouching. As the eyes are a precious possession you will do well to go to a good oculist's optician and explain your wants to

him. If you require a very high magnifying power it is a good plan to have the glasses decentred, so that the optic axes may be made to converge a short distance without causing eyestrain. Spectacles so arranged must be used for their special work only.

T. C.—The prints appear to be terribly over-exposed. Try making a strip test with a slow bromide paper, such as Ilford Slow. At one foot from the candle give, say, 20 seconds, then cover one inch with a card and give another, say, 20 seconds; slip the card further along and give another 40 seconds. Develop for two minutes. If all these are over-exposed, make another test, giving 5, 10, and 20 seconds. This test ought to bring you into the region of correct exposure.

N. R.—You can obtain a copy of the "Illustrated Guide and Descriptions of Photographic Inter-Lens Shutters" from the author, Mr. William O. Hammer, 1085, 14th Street, San Francisco, Cal., U.S.A. The price is $2.50 (about 12s. including postage). It is impossible to say what the F/values of the stops are. In the old days every maker marked the apertures as he pleased. If you divide the focal length by the diameters of the openings, it will give you an approximate idea.

H. T.—Your proposed arrangement of studio should work out quite satisfactorily. As regards the ribbed glass, we do not think this alone will keep out the glare of direct sunlight, so that you will require thin white curtains or blinds in addition, then you will have no trouble. If you want to be able to change over sides when the sun comes on the north-west side you will require the same amount of glazing on the other side, but you only show two narrow windows which do not reach the eaves.

J. B.—The engine and dynamo will be a comparatively costly affair. If you could buy second-hand we should think £50 is the very least you would need to spend, and probably when you come to buy you will find it is nearer £200. You would have to buy an enormous lot of carbide to compensate for this outlay; in fact, acetylene is a very good light for the Hana printer, or you could get one of the Kitson incandescent lamps from the Kitson Empire Lighting Company, Stamford, Lincolnshire.

G. M.—It is not possible to say what size of accumulator you will want without knowing the amperage required by your lamp. In any case, we are of opinion that the cost of an accumulator to give a light equal to a good incandescent gaslight such as the "Howellite," sold by Messrs. Griffin, will be out of proportion to the benefit and convenience of an electric light source. We think when you come to make enquiries, say, from a firm of suppliers of accumulators for motor-car lighting, you will find this is the case.

W. G. A.—1. Addition of bromide tends to give denser not thinner negatives. 2. Potass metabisulphite should be dissolved in cold or at the most tepid water. If dissolved in boiling water part of the preservative sulphurous acid is driven off. 3. Apart from slow paper one cause is fogging of the margins of the bromide paper by light reflected from white paper on the easel or from a light-coloured easel. Try masking the paper with a black mask as soon as it is pinned up on the easel, and see if that improves matters.

Markings on Lens.—I have a lens that has been set aside while in the Army. It has the appearance on the surface of prismatic colours as a soap bubble shows. Can anything be done to remove them?—V. R.

Our advice is to do nothing to the lens, but to keep it in a dry place when not in use to prevent further deterioration. If any attempt is made to remove the tarnish it will probably spoil the definition. If the lens does not appear yellow when looked through, no harm has been done.

M. G.—1. No licence is needed. If you take photographs "on your own," that is are not paid by somebody else to take them, you have the sole right to reproduce, exhibit, and sell them. 2. We are not quite able to guess what liability you suspect. There is none except the very rare one that the photographs may contain something which is a libel upon some person, but during the past thirty or forty years there have been only one or two cases where it has been possible to restrain publication of photographs on this account. You seem to be imagining some danger which does not exist.

W. G.—The lattice print washer is not intended for standing water, and we do not think would wash evenly unless with running water. There is no better way for you than the dish-to-dish washing. If the prints are fixed in an alum-hypo bath you can eliminate the hypo very quickly by running them through an ordinary laundry wringer between the changes. Six changes of five minutes each would be quite safe, especially with the wringer, which is much used by while-you-wait workers. This method is similar to the sponging, but quicker and more effective; twice through would be enough, once after the first washing water and once after the last.

G. M.—It is rather difficult to advise you with regard to the enlargement. Any stain or dye will tint the high-lights as there is a coating of gelatine on the paper before the carbon image is transferred to it. The only thing we can suggest is to give a thin coating of brown oil paint, using Lyddon's medium, and then to wipe it off the high-lights. To anyone used to the process this would be only the work of half an hour, and when finished the carbon would show no trace of doctoring except the alteration in colour. If the picture is not a large one, we should advise you to have another print done in a warm black. If the negative has not been cleaned off the cost will only be four or five shillings for a 20 by 16.

A. S.—For permission to take photographs, you should apply as follows:—Windsor Castle: Captain Campbell, Holly Lodge, Windsor. Tower of London: Constable of the Tower. Application should be made four or five days ahead, and should be accompanied by some letter of introduction or reference as to identity. Parks: For the Royal Parks—namely, Hyde Park, St. James's, Kensington Gardens, Regents Park, and Bushey Park: the Commissioners of H.M. Works and Public Buildings, Whitehall, London, S.W. Almost all other parks are under the charge of the London County Council, and application should be made to the L.C.C., Spring Gardens, London, S.W. St. Paul's is the worst building in London for getting a good photograph of Practically the only view point is from an upper window of buildings about half-way down Ludgate Hill. There are plenty of view points for the Tower—namely, on Tower Hill, from the Tower Bridge, and along the Embankment on the Middlesex side, and from one or two places on the Surrey side.

The British Journal of Photography.

Line Advertisements.

Charges for Insertion.

Since advertisements cannot be inserted until fully and correctly prepaid, senders of line announcements are asked to bear in mind the scale of charges. They will thus save themselves delay in the publication of their announcements. A Schedule by which an advertisement can be correctly priced will be sent on request.

Net Prepaid Line Advertisements.

12 words or less 1/-
Extra words ... ... 1d. per word.
(No reduction for a series.)

Special Note. Box Number Advertisements.

"Box No." and office address ... ... charged as 6 words.
For forwarding replies add ... 6d. per insertion for each adv't.
If replies are called for this latter charge is not made.

Advertisements cannot be inserted until fully and correctly prepaid.

Orders to repeat an advertisement must be accompanied by the advertisement as previously printed.

Advertisements are not accepted over the telephone or by telegram.

The latest time for receiving small line advertisements is 12 o'clock (noon) on Wednesdays for the current week's issue.

Displayed Adv'ts should reach the Publishers on Monday morning.

The insertion of an Advertisement in any definite issue cannot be guaranteed.

HENRY GREENWOOD & CO., Ltd., Publishers,
24, Wellington Street, Strand, LONDON, W.C. 2.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3091. Vol. LXVI. FRIDAY, AUGUST 1, 1919. Price Twopence.

Contents.

	Page
Ex-Cathedra	437
The Ethics of Specimens	438
Practicus in the Studio. By Practicus	439
The Photographic Correction of Negatives Taken Obliquely. By L. P. Clerc	440
Patent News	444
Catalogues and Trade Notices	444
Meetings of Societies	444
Commercial and Legal Intelligence	444
News and Notes	445
Correspondence— A Professional Photographic Assistants' Association—Co-operative Holiday Closing of Studios—Stereoscopic Photography—A Holder for Bromide Paper on the Enlarging Easel—Metal Dishes for the Hypo-Alum Toning Bath — Plate Tests A Suggestion to the R.P.S.	446-447
Answers to Correspondents	448

SUMMARY.

Consideration of the question of window specimens not the personal work of the photographer raises points which show the difficulty of drawing a hard-and-fast line between what is reprehensible and what is not. The continuance of the exhibition of portraits made by a previous proprietor of a business which has changed hands is commonly considered as unobjectionable, although it may involve as much misrepresentation as the use of bought specimens in starting a new business. In passing judgment upon any case of this kind, it is necessary to examine the individual circumstances. (P. 438.)

In his article this week "Practicus" deals with the intensification of portrait negatives, pointing out how the use of an intensifier may make a negative worse than it was before, and indicating methods of intensification which are particularly serviceable for negatives made in the studio. (P. 439.)

The concluding portion of the paper by M. L. P. Clerc on the correction of aerial negatives taken obliquely deals with the construction of cameras serving to carry out automatically the correction of the distortion introduced by inclination of the lens axis at the time of exposure. (P. 440.)

Although the report of the Eastman Kodak Company for 1918 records a somewhat lower figure for "nett earnings," the much larger provision for taxation shows that the company has fully recovered from the set-back in 1917. For 1918 a dividend is declared of 45 per cent. as against 30 per cent. for 1917. (P. 443.)

Co-operative holiday closing of studios, design of enlarging easel, dishes for hypo-alum toning, and suggested tests of plates by the R.P.S. are among the subjects dealt with by correspondents. (P. 446.)

In a County Court case at Hereford a photographer was a successful plaintiff in an action for payment of £37 for a series of commercial photographs. (P. 444.)

Dissatisfaction with the degree of colour correction given by non-screen orthochromatic plates is very often due to insufficient exposure. (P. 438.)

"Colour Photography" Supplement.

Details are given from the patent specification of Mr. Joseph Shaw of a six-colour method of colour cinematography upon the additive system. (P. 29.)

In a contributed article Lieutenant H. E. Rendall, R.N., in the course of reviewing current methods of making the set of colour-sensation negatives makes a suggestion for the readier production of such from a line mosaic colour-screen-plate negative such as the Paget. (P. 31.)

EX CATHEDRA.

No-Screen Ortho Plates. The orthochromatic plate having a dyed emulsion which serves as a screen instead of a separate screen fitted to the lens being required is to-day one of the most popular among all classes of photographers, yet many fail entirely to get the best results from its use. The colour corrective power of such a plate is, of course, limited, and it is not possible to obtain a result upon this type of plate equal to that from a properly screened ortho or panchromatic. The extent of the correction given by the "non-screen" plate is about equal to that of an ordinary ortho used in conjunction with a x2 screen. The bad results (we refer to colour correction) that we have seen with the "non-screen" plate in the hands of inexperienced photographers are almost entirely to be traced to the fact that insufficient exposure has been given. We do not mean that in a technical sense the negatives have been under-exposed, but that *more* exposure is required, in order that the colours of the subject that reflect light of a poor photographic quality may impress themselves fully upon the sensitive emulsion. For the reason mentioned above, many pictures taken upon these plates are no better in the matter of colour rendering than would have been the case with plates of the non-ortho variety. Very full exposures should always be given, where possible, and very much better colour translations will be obtained.

* * *

Towels and Swabs. As a delusion and a snare we do not know of anything which will approach the dark-room towel as usually met with. It is true that it will usually remove a certain amount of moisture from the hands, but at the same time imparts to them a more or less appreciable quantity of such chemicals as may have been used during the previous few weeks. The origin of many mysterious stains and markings upon plates and paper may be traced to this source. As an instance of this, we may relate the case of a photographer who lifted a few negatives out of the fixing bath, and, without rinsing his fingers, wiped them upon the towel. Five minutes later, wishing to make some P.O.P. prints, he carefully washed his hands and dried them upon the *same towel*. When the prints were finished some showed stains in the corners, in spite of his "clean" fingers, and it was not until it was pointed out to him that he realised where the hypo had come from. There is no better plan of securing clean work than that of keeping two or three good swabs by the dark-room sink. These can be used for roughly drying the hands upon, and for mopping up any chemicals which may be spilt upon the benches. A trace of dry amidol floating about may cause endless trouble, but if the bench were swabbed down immediately the mixing of a developer is finished this would be obviated.

The open network swabs, such as are used in bars and restaurants, are the best to use, and they should be frequently rinsed and wrung as dry as possible. Then the towel may be kept to its proper use, that of drying clean hands.

* * *

Speed Numbers. A great many photographers put too much confidence in the speed numbers marked on the labels of their plate boxes without realising that the numbers of one maker are rarely comparable with those on the labels of another. One of the fastest plates that we have ever used was marked with a speed of only 250 H. and D., yet the negatives were equal in every respect, and in some possibly superior, to those taken on plates marked with higher speeds. The fastest plates on the market as a general rule have not the density-giving powers of those of a more moderate speed, and will stand little or no forcing during development. The most important point lies in the photographer having a complete understanding of the behaviour of the most rapid plates that he employs, and particularly of the extent that each may be forced in development without fogging. Every fast plate has some little peculiarity all its own, and it will be found that an understanding of this will be of far more advantage in actual practice than the running after what may be speed numbers of fictitious value.

THE ETHICS OF SPECIMENS.

The interest which continues to be manifested in the question of photographers showing as specimens work which they have not personally produced shows that the matter is regarded as an important one, and indicates great faith in the value of a good show of pictures as an aid in attracting business; naturally, therefore, the beginner is desirous of acquiring a collection of specimens as soon as, or even before, he has taken down his shutters for the first time.

Undoubtedly the general public regard the prints exhibited by a photographer as genuine specimens of the current work sent out by him, and any departure from this is rightly regarded as more or less fraudulent, whether the specimens have been actually made by him or not, and it may be interesting to consider a few situations having a general bearing upon the question. In the first place there is the case of a man who may have been an amateur or an assistant in another studio who purchases a business and continues it on the strength of the previous proprietor's negatives and reputation, merely changing the name or sometimes trading under the old name to which he is now compelled to add his own as proprietor, although even this need not be done upon the prints, which often are what advertise the studio. Although this is a flagrant case of "bought specimens," we think few of our professional friends would raise any objection to it, because it concerns an established business, and does not bring a new competitor into the field. It is felt rightly enough that if the old standard is maintained things remain as they were, while if the work deteriorates so much the better for the other photographers in the district. It is certain that a man must stand or fall by the work he sells to his sitters, and that though a certain amount of chance trade may be obtained by the window display, it is the current work which secures the steady growth of a business through the recommendation of satisfied patrons.

A somewhat different position is created when an ex-assistant who has legitimately acquired specimens while in employment starts upon his own account. It is well known to all practical men that it is easier to produce good work in a well lighted studio with perfect apparatus than when handicapped with a more or less unsuitable position and such lenses and cameras as can be cheaply acquired, so that it is quite possible that a lower standard will be attained and the public be disappointed. There are geniuses who can turn out good work under the most adverse conditions, but as was shown in the course of a law case a few years ago, a change from one studio to another even in the same street may play havoc with an established reputation.

The acquirement of a sufficient stock of specimens is quite a stiff problem for the beginner, but if he or she be not prepared to face it in a straightforward way, it would be better to give up the idea of becoming a photographer at all, as it betrays a lack of both skill and confidence in one's own work to shirk it. Every operator has some ideas as to style, and finds it easier to work upon his own lines than to follow other people, therefore he should prepare specimens of a style and quality which he can easily reproduce when sitters begin to come in. There are now three principal ways to become a portrait photographer, the first and most orthodox being to become an assistant or pupil in a good business. This should be the best way, but unfortunately many of the most artistic workers are either averse from teaching their methods or are temperamentally unsuited to do so. Hence there is danger of the novice falling into the hands of those who are out for a big premium, and in return put the pupil to any form of drudgery which may pay him best. As an example of what has actually occurred we may mention a case where a hundred-guinea premium was paid for a two years' term, during nearly the whole of which period the pupil was kept to developing amateurs' films. The prospect of acquiring either specimens or the ability to produce them is in such circumstances a very poor one, and if the victim has the necessary money to start, it is not to be wondered at if he purchases them as he purchases the remainder of his furnishings.

Another door to the profession is from the ranks of the amateurs, which simply means that in many cases people who are desirous of learning photography find that they have to teach themselves, which, with many trials and tribulations, they have succeeded in doing. Such folk are usually quite honest over the specimen question, for they are usually so satisfied with their work that they would not dream of supplementing it by the usual thing.

Yet others follow the American plan of studying photography in a school as others study pharmacy and art. This is an excellent way, as much time is saved by the avoidance of useless experimenting, and after a preliminary period of training in the technique of photography the student can by actual work in the studio acquire confidence in his own powers, and eventually collect a series of portraits and studies which will do him good service when he takes the plunge. There are more photographers in the country who have started in this way than most people imagine.

When we come to enlargements and miniatures we think all requirements are met if customers are supplied with work equal to the samples exhibited, no matter by whom these are made. In most cases the work done by good trade houses which specialise in certain lines is far in advance of anything which the photographer could do on the premises. There is an unfortunate tendency in some quarters to exhibit "first-class finish" work in the window and to supply second-class or even lower grades in fulfilment of orders. This is simply dishonest, and the more so as the price asked would be quite a fair and usual one for the best work.

PRACTICUS IN THE STUDIO.

[Previous articles of this series, in which the aim of the writer is to communicate items of a long experience in studio portraiture, have appeared weekly since the beginning of the present year. It is not thought possible to continue the series to the length of that by the same writer which ran through the "British Journal" some years ago, but if any reader among the younger generation of photographers, and particularly those engaged as assistants, has a particular subject which might be dealt with, his or her suggestion will be welcomed. The subjects of the previous articles of the series have been as follows:—

A Talk About Lighting (Jan. 3).
The Camera and the Lens (Jan. 10).
Managing the Sitter (Jan. 17).
Backgrounds (Jan. 24).
Studio Exposures (Jan. 31).
Artificial Lighting (Feb. 7).
Printing Processes for Portraiture (Feb. 14).
Studio Accessories and Furniture (Feb. 21).
The Surroundings of the Studio (Feb. 28).
Studio Heating and Ventilation (March 7).
The Postcard Studio (March 14).
The Printing-Room (March 21).
About the Reception Room (March 28).
Home Portraiture (April 4).
Portable Studios (April 11).
Copying (April 18).
Handling the Studio Camera (April 25).
More About Lenses (May 2).
Enlargements (May 9).
Advertising the Studio (May 16).
Mounts and Mounting (May 23).
Business Methods (May 30).
Photographing Children (June 6).
Portraits of Elderly People (June 13).
Something about Lenses (June 20).
Hand Cameras for Professionals (June 27).
The Dark-Room and Its Fittings (July 4).
Plates and Their Work (July 11).
Apparatus Repairs and Renovations (July 18).
Posing the Head (July 25).

INTENSIFYING PORTRAIT NEGATIVES.

INTENSIFICATION is a process which is now, thanks to a better understanding of the principles of development, not so extensively practised as it was in the earlier days of gelatine plates, when thin images were common, and a large proportion of negatives required strengthening. Still, there are occasions when intensification is absolutely necessary, and others when it is beneficial if done in moderation. In many photographers' minds there is some confusion of ideas as to when intensification is necessary, and negatives which would have yielded a decent print if left alone have been absolutely ruined by the treatment. I will take as an example the portrait of a man in dark clothes, where the exposure has been insufficient and the development prolonged until the face and hands are of fair printing density, but the clothes remain too thin to give any detail in the print. If such a negative be intensified we shall find that the detail in the clothing is certainly improved, but the face and hands have become so dense that the finer gradations are buried, and so much longer printing is necessary that the value of the increased density in the clothing is lost. With such negatives better results may be obtained by treatment with matt varnish or papier mineral, on which the clothing may be strengthened with blacklead, than by a general treatment of the entire image. It is even better to use a soft-printing paper without faking the negative at all than to increase the contrasts, which are already too violent, by intensification. Flat, foggy negatives are also disappointing when intensified in the ordinary way, as the fog is also thickened, so that we get a dense film which is slow to print, and shows little improvement in contrast. If I have such to deal with I usually give them a dip in strong ferricyanide and hypo so as almost to clear the shadows before intensifying, after which the image appears nearly equal to an originally good one.

There are two preliminaries to successful intensification: thorough fixing, and equally thorough washing. If a negative is not properly fixed, we shall find various stains and patches occur during intensification; while if the washing is insufficient, we shall usually find yellow patches, arising from precipitation of the mercury salt used for bleaching. An exception to this is found when mercuric iodide is used, as only a few minutes' washing is needed for this method.

Mercurial intensification is the most popular treatment in most studios, because it is simple, and if properly carried out is fairly permanent. Unfortunately, this is seldom done, as ammonia is commonly used for blackening, and when this is done it is only a question of months before the negatives turn yellow and lose much of their printing value.

The most general method of using mercuric chloride, or, more popularly, bichloride of mercury, is to make a saturated solution by placing an ounce or more in a twenty-ounce bottle, filling with tepid water, and shaking for a few minutes. A considerable proportion of the crystals will remain undissolved, but this does not matter, as they will dissolve when more water is added to make up the bulk as the solution is used up. The solution may be returned to the bottle after use and allowed to settle. I am always careful only to decant off the clear solution for use, and I am never troubled with pinholes in the negative, which plague some workers. A stronger solution may be made by adding an equal weight of common salt or chloride of ammonium when dissolving the mercury, but I have not found this to be necessary. The negative should be immersed in the mercury solution until it is evenly bleached on both sides, the dish being rocked as in development, or "ripple" marks will appear. After bleaching, the negative must be washed for at least half an hour in running water, or, if this is not available, in frequent changes. I have in the latter case found it useful to put a little common salt in one of the changes, as this increases the solubility of the mercury. After washing, the bleached image must be blackened, and there are several solutions which may be used for this purpose. The most usual and least desirable is a three to five per cent. solution of liquid ammonia. This gives great density, but has a tendency to block up detail in the lights, and is not permanent.

Another and better way is to re-develop in an ordinary amidol or ferrous oxalate developer. Whichever is used, the blackening must be thorough, but in the case of ammonia not allowed to continue after the highest lights have blackened, or a reduction in density will commence, ammonia having a solvent effect upon the image. A few minutes' washing is needed after blackening, and care should be taken that "tear-drops" do not form on the surface, or they will cause irremovable markings when dry.

A better way of employing mercury is to use it in the form of iodide. The solution is a little more trouble to make, but much simpler to use; moreover, any desired degree of density may be obtained, as the action may be stopped at any stage, and the thinner parts strengthened without blocking the high lights. Another useful feature is its applicability to local

intensification, as it may be applied with a brush or pad of cotton-wool where needed. It is made as follows:—

A.—Mercuric chloride ..... 175 grs.
Water ..... 10 ozs.
(Mix this in a 20-oz. bottle.)
B.—Potass. iodide ..... 1 oz.
Water ..... 10 ozs.

Add about two-thirds of B to the 10 ozs. of A, and shake well. There will be a copious red precipitate. Now add more of B, a few drops at a time, until the precipitate is redissolved. The mixed solution may be used repeatedly until it becomes too slow in action. For portrait work it is generally desirable to dilute the solution made as above with an equal bulk of water.

The negative is washed for four or five minutes after fixing, and then immersed in the mercury solution; it becomes rather lighter in colour, but does not quite bleach. When the desired intensity has been attained the negative is washed until the back of the plate shows an orange colour. This is removed by a short immersion in a one per cent. solution of hypo, after which it is thoroughly washed. If the density is too great it may be reduced to any extent by immersion in a plain twenty per cent. hypo bath. Greater density may be attained by substituting an ordinary amidol developer for the hypo bath used to remove the orange colour.

The value of this developer to the portraitist is obvious. Where only one negative of a sitting has to be intensified, it can be done five minutes after fixation is complete, so that the negative can go into the washing tank with the others belonging to the same order. Another good point is that the image, although strengthened, retains its transparency, and keeps a good colour for retouching. The mercury solution keeps well, and when partly exhausted is excellent where only a slight increase of density is required. I may say that in my hands neither the mercuric iodide dissolved in sulphite, as recommended by Lumiere, nor the tabloid form have worked so well as the solution made according to the above formula.

I will now deal with a non-mercurial intensifier which possesses many advantages, not the least being absolute permanence. Its only drawback is that it is a "two-step" method, so that its action cannot be governed in the same way as the mercuric iodide. The original formulæ of the inventor, Mr. Welborne Piper, will be found in the B.J. Almanac, but as the quantities given are for one ounce only, I give a method of mixing which will be found more convenient in everyday work. Two stock solutions are made, one being potassium bichromate 1 oz., water 10 ozs.; the other, hydrochloric acid (pure, not spirits of salts) 1 oz., water 9 ozs. To make the bleacher for ordinary portrait work, take one part of bichromate solution and three parts of water, and add to each ounce one drachm of the diluted hydrochloric acid. The negative, which needs only slight washing after fixation, is immersed in the solution until bleached (which should occur in about a minute), and is then well washed until the transparent parts are free from the yellow stain. It is re-developed in amidol or metol-hydroquinone until thoroughly blackened. It is desirable to re-develop in diffused daylight, although this is not absolutely necessary with amidol. If the first application does not give sufficient density the whole process may be repeated, but I have never found this necessary with portrait negatives. The colour given is a fine neutral black, and there is no appearance of intensification on the surface. In this it differs from the mercury and ammonia, which leaves a rough surface.

It is very desirable that all intensified negatives, especially those treated with mercury, should be varnished, to prevent their tarnishing by exposure to the atmosphere, and, in the case of platinum printing, action on the paper. If it be inconvenient to varnish, retouching medium may be rubbed all over the surface. This not only serves as a protection, but prevents a mark showing at the edge of the medium, which is almost certain to appear on mercury and ammonia plates.

There are several other intensifiers in ordinary use, but I have not dealt with these, as I have not found them so suitable for our special purpose as those described above. The mercuric bromide and silver cyanide method is an excellent one for very thin and flat negatives, but it is apt to give too much contrast for portrait work, and pure 98 per cent. cyanide is not a desirable chemical for ordinary use. The uranium intensifier has its uses, as it will bring very thin images up to good printing density, but as the image is of an orange colour it is almost impossible to judge of the value of any retouching upon it.

PRACTICUS.

THE PHOTOGRAPHIC CORRECTION OF NEGATIVES TAKEN OBLIQUELY.

[For the purposes of the French Army Aviation Service, in which he was engaged during the greater part of the war, M. L. P. Clerc has investigated with great thoroughness the mathematical conditions involved in transforming a photograph taken from an inclined aerial camera into one corresponding with that obtained from the same view-point, but with the lens-axis vertical. His study has led him to the design of a purely automatic camera carrying out this "redressement." Inasmuch as aerial photographic mapping promises to be an important peace-time application of photography we publish a translation of the text of his paper.—EDS. "B.J."]

(*Continued from page* 430.)

III. CORRECTION CAMERAS.

§ 15. *General Conditions of Construction.*—Unless one is ready to carry out numerous trial adjustments, which render the correction process really impracticable, it is necessary that the two axes of the rocking frame, themselves parallel, should cut the optical axis at right angles and should be contained in the respective planes of the images, the axes of the frame being thus conjugate to each other as regards the lens which is used—that is to say when the adjustment is made without decentering. In order to allow of a better illumination of the negative to be corrected, when the work is done by artificial light, the axes of the frame should preferably be horizontal, the intersection of the planes then taking place above. The frame should allow of inclinations of, at least, 30 degs.

The negative carrier should hold the negative so that the principal horizontal of the negative can always be brought to coincide with the axis of the pivoted frame. Use can be made of a plate turntable, allowing of the negative being placed at any desired angle and also of a rise and fall (decentering) movement perpendicular to the axis, [8], and permitting of bringing the principal horizontal on to the axis even in the case of negatives which have been made in a camera with the lens decentered. In order to assure this coincidence a register line should be made either in the plate-holder or in the negative carrier itself, for example, in the form of a knife-edge capable of being applied on to the image face of the negative and of being withdrawn after adjustment out of the path of the effective light rays. An angular graduation on the plate turn-table of the negative carrier makes it easy to place the negative in its plane.

[8] There is no object in providing the negative carrier with decentring movement parallel to the axis of the rocker, since a shift of the negative parallel to the direction of its horizontal dimension does not in any way affect the corrected image.

A metric scale, measuring the displacement of the negative when decentered, will facilitate the decentering operation.

The lens should be provided with a shutter operated from outside the camera.

The plate-holder should preferably contain a sheet of glass so as to allow of the use, at choice, of sensitive paper as well as of plates, and even of the tracing of the corrected image on a semi-transparent paper. The front surface of this glass will bear against a rebate in the plane of which is the axis of the frame so as to allow of the glass being replaced without modification of the adjustment.

Graduation of the baseboard of the camera such that the positions of the lens carrier and of either the negative or the plate-holder (the other remaining fixed) for different values of n will serve to restrict the preliminary trials in bringing the two axes of the rocking frame into the positions which correspond to the enlargement desired.

Preferably the camera should include an automatic connection of the lens and the two axes of the swinging frames, so that these latter remain constantly in conjugate positions relatively to each other. A single scale indicating enlargement will then suffice. The negative carrier and the plate-holder may advantageously be provided with graduations giving the value of the angles α and β, or better still the trigonometrical lines of these angles entering into the adjustment formulæ. The angles α and β being defined in all cases by their sines (conditions C and D), use will preferably be made of sine indicators *, which can also furnish at the same time the values of the corresponding cosines as an aid to the calculation of decentering.

Preferably the camera should comprise a connection of the planes of the negative and of the corrected image such that the condition (A) is satisfied automatically. If this is done a single sine indicator giving the inclinations β of the plate-holder, or, if the operations are limited to correction without decentering, a sine indicator giving the inclinations α of the negative carrier will suffice.

The size and position of the plate-holder should be such that up to the limit admitted for the angle ω, the corrected image can be entirely formed on the plate or on the sensitive paper. Now, it is easy to be seen (fig. 14)

Fig. 14.

that two equal segments P A = P B on the line of greatest inclination of the negative respectively to the axis of the frame (limits of size in the case of negatives made with a camera with lens central) give unequal images, P A′ being greater than P B′. The dissymmetry of the corrected image relatively to the axis of the framework will be appreciably exaggerated if the negative is decentered.

We will now determine the form and the dimensions of the corrected image and the position of the point P′ in this image in the case of a 13 × 18 cm. camera (12 × 17 effective) of .26 metre focal length, inclined at an angle of ω = 30 degs., the longer side of the plate remaining horizontal, correction being done with a lens of .3 metre focal length without decentering. Here we have

$$m = 1.154 \qquad n = 2.006.$$

The corrected image is identical with that taken from the same view-point on a horizontal plate with a lens of focal length F′, such that

$$F' = n \times \cos 30 \times F = 2.006 \times .866 \times .26 = .45 \text{ metre.}$$

Its enlargement, relatively to the image made from the same view-point on a horizontal plate with a lens of .26 metre focal length is $n \cos \omega = 2.006 \times .866 = 1.732$, and the distance P′ V′ of the image of the principal point at the vanishing point of the verticals (image of the point vertically below) is $P' V' = n F \sin \omega = 2.006 \times .26 \times .5 = .26$ metre.

In order to determine the dimensions of the corrected image it will suffice to compare, whilst making allowance for the enlargement calculated above, the dimensions of areas on the ground included on the 12 × 17 plate from a given altitude, first vertically and then

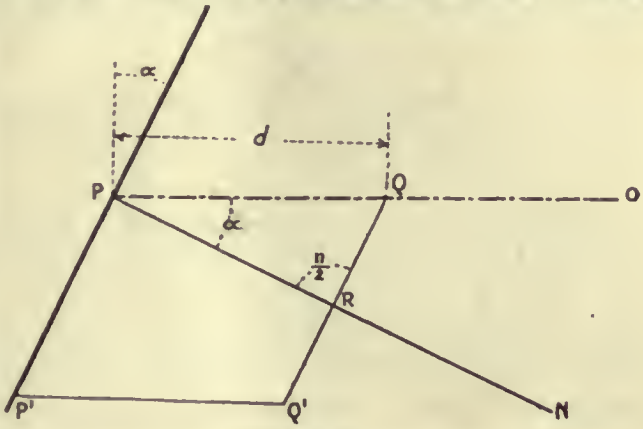


Fig. 15.

with an inclination of 30 degs. In the vertical view the rectangle included at an altitude of 2,500 metres will measure 1,150 by 1,630 metres: at 30 degs., the trapezium included has bases measuring 1,675 and 2,165 metres, and a height of 1,550 metres, the point immediately below the objective being outside the trapezium and at a distance of 760 metres from its smaller base. We have thus all the elements necessary for the determination (fig. 16) of the form and dimensions of the corrected image.

It will thus be seen that a plate-holder of effective dimensions of 40 by 60 cm., the longer side being placed parallel to the axis

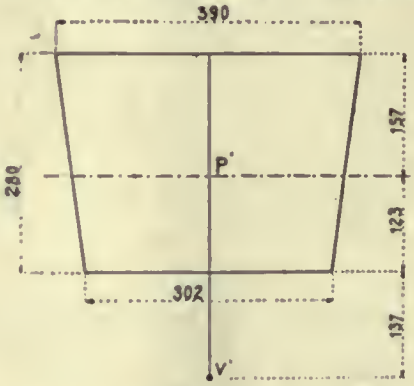


Fig. 16.

of the frame, will permit of registering the whole of the corrected image in the great majority of cases, even when allowing for a slight rotation of the plate in its plane. In order to provide for the decentering of the negative carrier the plate-holder should be fitted with a decentering movement opposite to the intersection of the planes of the negative and of the corrected image.

§ 16. *Automatic Connection of Movements of Correction Camera.*—In Fig. 17 is represented a section of the system including negative, lens, and plate-holder on a plane constructed through the optical axis perpendicularly to the planes of the negative and corrected image. At P and P′., the intersections of the optical axis with the planes in question, draw perpendiculars to these planes. These straight lines intersect at N. From N let fall a perpendicular on the optical axis, meeting this axis in O′. The angles O M P and O′ P N are equal, as are also O M P′ and O′ P′ N. From similar triangles we have

$$\frac{O\ P}{N\ O} = \frac{M\ O}{O'\ P} \qquad \frac{O\ P'}{N\ O'} = \frac{M\ O}{O'\ P'}$$

But $O P' = n\ O P$ whence $O' P = n\ O' P'$
and since $O P + O P' = O' P + O' P'$
it follows that

$$O' P' = O P$$

* Consider a jointed parallelogram (Fig. 15), one corner of which is in P on the axis of the rocker, another in Q on the optical axis O P, at the fixed distance P Q from the point P, the side P P_1 coinciding with the projection of the plane of the negative, and the corner Q_1 being free. The straight line P N, perpendicular in P to the plane of the negative, cuts off on Q Q_1 a segment Q R, the length of which, calculated from the right-angled triangle P Q R, is

$$Q R = P Q \cos P Q R = P Q \sin \alpha$$

On the other hand, the straight line Q Q_1 cuts off a segment, P R = P Q cos α.

and that, therefore, the position of O′ is independent of the angles α and β, but depends only on the value of n, the locus of N, when α varies, being the perpendicular on the optical axis at O′.

This property has been utilised in the construction of the enlarger-corrector of J. Carpentier (French patent No. 306, 108 of Dec. 8, 1902), a camera in which the axes of the rocking frame are fixed, the

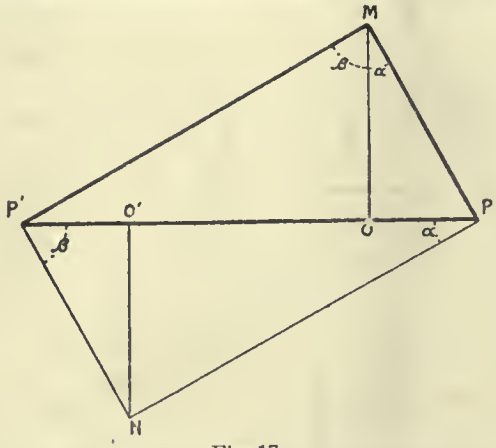


Fig. 17.

enlargement n along the optical axis being constant. It will be seen later that this arrangement can, however, be employed when enlarging and correcting with a variable degree of enlargement.

Another method of connection has been pointed out by G. Labussière. In fig. 18 set off on the optical axis a segment P′T equal to the focal length f of the lens used for correction and draw at T a perpendicular to the axis. At P′ draw a perpendicular to the plane

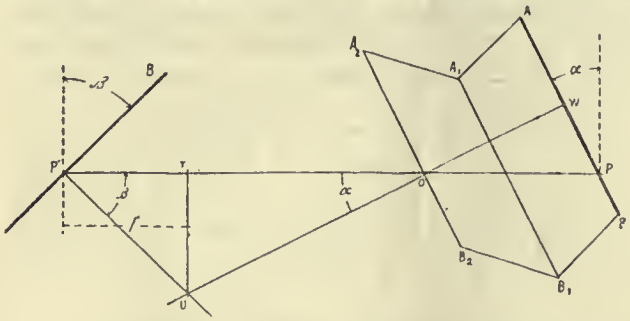


Fig. 18.

P′ B′ of the corrected image. This latter straight line meets the preceding at U. Join U O, produce this line and let fall upon it from the point P a perpendicular P W. Denoting the angles T O U and T P′ U respectively by α and β, we have

$$T\,U = P'\,T \tan \beta = O\,T \tan \alpha$$

But, with the same symbols as hitherto used, we have

$$O\,P' = (n + 1)\,f \text{ whence } O\,T = O\,P' - P'\,T = n\,f$$

If, now, we replace in the above equation the segments P T and O T by their values we have

$$f \tan \beta = n\,f \tan \alpha$$

or, after simplification,

$$\tan \beta = n \tan \alpha$$

It is thus seen that the plane P W will be constantly conjugate to P′ B′ if P is itself the conjugate of P′, their inclinations on a plane at right angles to the optical axis satisfying condition (A).

For the establishment of a mechanical connection based on this property, we can join together two jointed parallelograms ABA_1B_1 A_2B_2, one of the sides A B coinciding with the intersection of the plane of the negative, whilst the opposite side A_2B_2 has a point fixed at O and is connected to the straight line O U perpendicular at O to A_2B_2. The arms AA_1 and AA_2 will be chosen of length such that O P can be of any length, corresponding to the required degree of enlargement. A guide groove T U, engaged by the rear element of the camera at the fixed distance f from the axis of the pivoted frame will keep the intersection of the arms P′ U and O U in the necessary position.

Mention may be made, by way of review, of two methods of connection described in the patent of Th. Scheimpflug (French patent No. 339,655 of Jan. 16, 1904), which sets forth, though in a somewhat confused way, the principles employed in the construction of a series of correction cameras. The different elements of the camera are mounted on concentric racks having their centre at M (fig. 19).

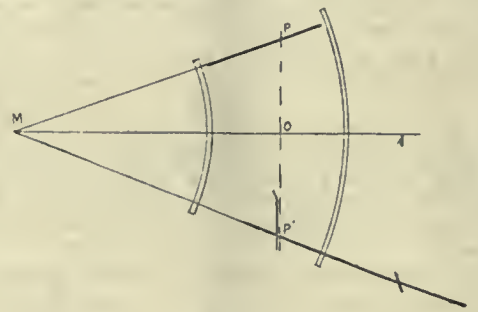


Fig. 19.

Each of the parts, negative carrier, lens, and plate-holder, is in a radial plane of the cylinder, the axis of which is perpendicular at M to the plane of the racks, and can slide in its plane so as to be capable of being brought to any required distance from the axis M. The other construction is applicable only to the case where the two axes of the frame are conjugate to each other and equidistant

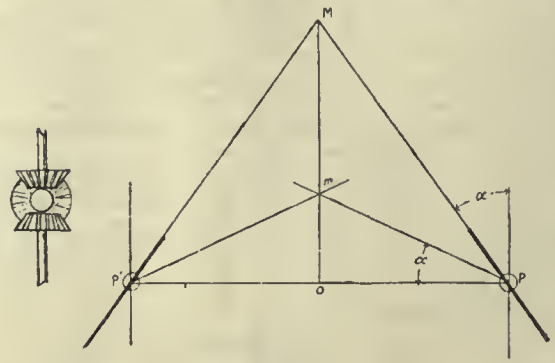


Fig. 20.

from the optical centre, say each at the distance of $2f$ from the latter. Angling of the planes of the negative and of the image is transmitted by a system of three angular pinions (fig. 20) having arms turning round the same axes as the planes in question. The arms turn through angles equal but opposite to those through which the planes turn. In order to assure the adjustment it is sufficient

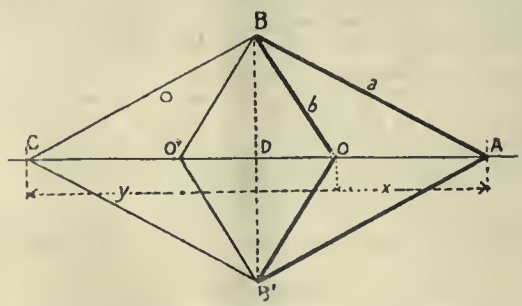


Fig. 21.

that the intersection m of these two arms shall be kept in the straight line O M perpendicular at O to the optical axis.

Of other approximate methods of connection, suitable only for very small angles, and, therefore, of little use for cartographic work, may be mentioned those of Pasqueau, J. Olive, and R. Aubry.

§17. *Automatic Enlarger-Corrector of L. P. Clerc.*—In October, 1916, the present writer pointed out the possibility of constructing an automatic correcting camera permitting of variable enlargement, and had a demonstration model of it made.

The conjugation of the axes of the swinging frame relatively to the lens is obtained by an "inverter" of Pauccllier previously described by G. Koenigs (French patent No. 300,117 of May 9, 1900) for the construction of ordinary photographic enlargers. In fig. 21 is shown the diamond quadrilateral A B C B′, each side of which measures a. Take a point O on the axis AC and join this point to the two apices B and B′ by arms of length O B = O B′ = b. Construct the other diagonal of the figure and let D be its intersection with A C. Calling the distances O A and O C respectively x and y, from the symmetry of the figure with regard to B B′, we have

$$OD = \frac{x-y}{2} \qquad AD = \frac{x+y}{2}$$

From the rectangular triangles A B D and O B D we have

$$BD^2 = AB^2 - AD^2 = BO^2 - OD^2$$

which can be written

$$A^2 - \left(\frac{x+y}{2}\right)^2 = b^2 - \left(\frac{x-y}{2}\right)^2 \text{ or } xy = a^2 - b^2$$

If the diamond quadrilateral is jointed so that the points A, O, and C lie constantly in the same straight line, the above relation will be maintained whatever may be the respective positions of these points. Now, the law of conjugate points may be written

$$(p - f)(p' - f) = f^2$$

If the lengths of a and b are chosen so that $a^2 - b^2 = f^2$, and if on the axis A C we bring each time opposite to the point O the segments A P = C P′ = f, the points P and P′ will be constantly in the conjugate positions for a lens of focal length f having its optical centre at O.

In order to combine this form of connection with the first of those for the connection of the swinging frames described in a preceding paragraph, it suffices to control the displacement on A C of a point O′ such that A O = C O′, and, therefore, also O P = O′ P′, which can readily be done by the two arms B O′ and B′ O′ of length b. Fig. 22 shows the arrangement adopted for the construction of the test model, supplementary connecting rods serving to ensure the parallelism of the lens carrier and of the frame in

Fig. 22.

which are fitted the guide grooves for the connection of the swinging frames. The negative carrier is provided with a sine indicator.

This form of connection is not adapted for same-size reproduction, nor for a moderate degree of enlargement for which n has nearly the value of 1. But we saw that, in the case of correction without decentring, the correcting lens could be chosen with advantage so that the enlargement would always be in the neighbourhood of $n = 2$. In order even to permit of reduction being made with this camera, for example, in bringing corrected photographs to scale, the negative carrier and the plate-holder should be made interchangeable. In the case where it would be necessary to make a reduction or enlargement on a scale for which n is nearly equal to 1 we should proceed successively to make an enlargement of n_1 and a reduction of n_2 such that $n_1 n_2 = n$, n_1 and n_2 may be chosen so as to come within the limits permitted by the camera. The complication is more apparent than real. If we start with the original negative, the corrected image is a positive, and it is necessary to make a negative for reduction to scale. In the case where a double operation would be necessary the final prints would be made not by contact, but by enlargement.

In the case where we would require to correct negatives made with a camera the lens of which had a focal length not in satisfactory

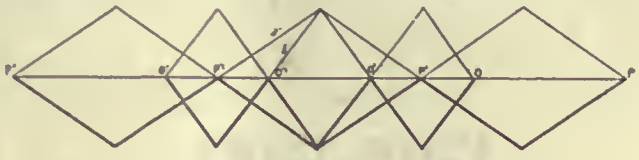


Fig. 23.

accordance with the focal length of the correcting lens, we should first make a preliminary reduction of the original negative, thus bringing its equivalent focal length to the required value.

In one special construction the transverse bulk of the connecting system could be reduced by adopting a series of jointed parallelograms, for example, coupling two series of three parallelograms (fig. 23) together. All the transverse dimensions would then be reduced two-thirds, and the lengths a' and b' of the arms would then be such that

$$a'^2 - b'^2 = \frac{f^2}{9}$$

L. P. Clerc.

[Correction.—The last sentence in the last instalment of M. Clerc's paper, namely, on p. 430 of our issue of July 25, should read as follows: "Denoting, as already done, the equivalent focal length of the corrected photograph by F′ and the focal length of the correction camera lens by F/m, we have . . . ."—Eds. B.J.]

EASTMAN KODAK COMPANY.

The annual report of the directors of the Eastman Kodak Company for the year ending December 31, 1918, shows that the Company and its subsidiary undertakings are further progressing in their recovery from the set-back in profit-making which was disclosed by the previous report, namely, that for the year ending December 31, 1917. In this latter year, as is shown by the statement of annual earnings since the year 1900, the net profits of the Company fell from, in round numbers, three and a-half million pounds to three million pounds. The figure for the net earnings for last year, namely, £2,897,313, certainly shows a further small decline from the total of 1917, but it must not be overlooked that the practice of showing as net earnings the amount which remains after taxation has been deducted, is one which masks the real profits of a company in comparison with previous years if taxation varies greatly as it has done during the last few years. Thus in the 1917 report the provision for war excess profits and income-taxes was only £824,000 as compared with £1,492,000 for 1918. We add the figure for 1918 to the statement given below, although, as we have just said, its smaller amount really represents greater incidence of taxation to an extent which has considerably counterbalanced the improvements in the Company's business.

		£
Year ending December 31, 1900	.....	465,816
,, ,, 1901	.....	517,347
,, ,, 1902	.....	564,455
,, ,, 1903	.....	606,740
,, ,, 1904	.....	688,484
,, ,, 1905	.....	827,610
,, ,, 1906	.....	1,116,639
,, ,, 1907	.....	1,446,479
,, ,, 1908	.....	1,540,725
,, ,, 1909	.....	1,619,087
,, ,, 1910	.....	1,850,552
,, ,, 1911	.....	2,401,910
,, ,, 1912	.....	2,886,401
,, ,, 1913	.....	2,920,090
,, ,, 1914	.....	2,332,579
,, ,, 1915	.....	3,245,600
,, ,, 1916	.....	3,564,784
,, ,, 1917	.....	2,998,467
,, ,, 1918	.....	2,897,313

For the year ending 1918, dividend payments amounting to 45 per

cent. were paid upon the common stock as against 30 per cent. for 1917. A further item in the 1918 balance-sheet which attracts attention is the increased figure at which "merchandise, materials, and supplies on hand" stand, namely, £4,757,000 as against £3,664,000 for 1917. It is evident that the Company has very speedily recovered from the set-back which it received in 1917. Its increase of dividend distribution corresponds with this recovery, whilst the marking up of the common stock on the Stock Exchange to a figure of its pre-war level, and higher, shows that investors take a confident view of the immediate capacity of the company for increased earnings.

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Applications:—July 14 to July 18.

PHOTOGRAPHIC APPARATUS.—No. 17,916. Photographic apparatus and pictures obtained therewith. H. W. Saw and C. W. Snook.

LENSES.—No. 17,749. Telephoto lenses. O. E. Wheeler.

PRINTING MACHINES.—No. 17,782. Photographic printing machines of the horizontal continuous type. C. F. G. Thorkelin.

CINEMATOGRAPHY.—No. 17,578. Cinematograph apparatus. J. G. Betjemann.

CINEMATOGRAPHY.—No. 17,579. Synchronised cinematographic and photographic recording and reproduction. H. G. Matthews.

COLOUR CINEMATOGRAPHY.—No. 18,020. Apparatus for colour cinematography. P. D. Brewster.

COLOUR CINEMATOGRAPHY.—No. 17,889. Production of cinematograph colour pictures. T. P. Middleton and T. A. Mills.

CATALOGUES AND TRADE NOTICES.

MR. B. V. SEXTON, trade and commercial photographer, of Bellevue Road, Southampton, sends us his 8-page list of prices for enlarging and printing, a copy of which may be had on application.

A WELLINGTON BOOKLET of a most attractive kind has just been issued by Messrs. Wellington and Ward, chiefly by way of emphasising the value of the Wellington Anti-Screen plates to the holiday-maker. Incidentally the booklet is a pictorial story of the charm of photography by sea, lake, or mountain. Messrs. Wellington and Ward will be glad to send a copy to any applicant.

ILFORD BROMIDE PAPERS.—Messrs. Ilford, Limited, have just issued a revised edition of the little instruction manual on the use of their bromide and gaslight papers. The manual deals in a thoroughly practical way with the clearing, toning, and glazing of prints and enlargements, and as a supplement to it the Ilford Company are prepared to send to bona-fide professional photographers a portfolio of six prints showing the results produced on the various grades of Ilford bromide. The prints, which are fine examples of portrait photography, admirably serve to show the very high technical excellence of the Ilford papers.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

SATURDAY, AUGUST 2.

St. Clements Press Photographic and Rambling Society. Outing to Sidcup, Bexley, Dartford Heath.

MONDAY, AUGUST 4.

North Middlesex Photographic Society. Outing to Limpsfield and Oxted.

WEDNESDAY, AUGUST 6.

Tonbridge Wells Amateur Photographic Association Members' Lantern Slides.

North Middlesex Photographic Society. "Bromoil." L. Dick.

THURSDAY, AUGUST 7.

Hampshire House Photographic Society. "Architectural Photography. C. J. Gooch.

Commercial & Legal Intelligence.

A CLAIM FOR COMMERCIAL PHOTOGRAPHS.—An adjourned action, Croot Tucker v. Kerr, was tried at Hereford County Court last week, before His Honour Deputy Judge Hargreaves. The subject of dispute was a series of photographs of the extensions at the Hereford Corporation Electricity Works made during the war. The plaintiff was Mr. John Samuel Croot Tucker, 22, Commercial Street, Hereford, and the defendant was Mr. Wm. Talbot Kerr, electrical engineer to the Hereford City Council. A total of £37 16s. was claimed, the items being as follow: Making twenty 12in. by 10in. negatives and submitting twenty rough proofs; eighteen prints at 25s. each, set in portfolio, and 102 unmounted prints at 3s. each.

Mr. S. R. C. Bosanquet was counsel for the plaintiff, and Mr. A. B. Whitfield for the defendant.

Mr. Bosanquet, in outlining the plaintiff's case, said Mr. Kerr requested Mr. Tucker to take some photographs for him of the new electrical installation at Hereford. The precise object for which they were wanted was not material to the plaintiff, and as a matter of fact he was not informed what it was. Plaintiff agreed to do the work, but no special terms were arranged. They were to be large-sized photographs, and the plaintiff exposed a number of plates. Mr. Tucker had to go down to the works on many occasions and spent a very long time there, the taking of the pictures necessitating also a very high degree of skill. The negatives were obtained under great difficulties owing to the cramped positions, absence of light, and trouble from reflections. The order was executed to Mr. Kerr's instructions, but when the bill was sent in defendant suggested that the prints were taken for the Hereford Corporation, and endeavoured to refer Mr. Tucker to that body for payment. Then subsequently plaintiff was told that the pictures were for the Electrical Brush Company, and then again they were for the Ministry of Munitions. Coming to the value of the work, Counsel mentioned that the three dozen 12in. by 10in. plates alone cost £4 5s. 6d.

Mr. Whitfield here interposed to explain that the defendant would not dispute the amount of the claim if his Honour found that the contract had been fulfilled. The defence was, firstly, that the photographs were not done in time for the purpose for which Mr. Kerr required them, and, secondly, that they were of no value for the purpose for which they were required.

The plaintiff said defendant called on him at the shop about taking the photographs, and witness asked what they were wanted for. Mr. Kerr told him to go down to the works and see Mr. Watson, and he would show him what was required. Mr. Watson, who was second in charge of the works, showed him round the whole of the plant, pointed out the objects to be photographed and the positions from which they should be taken. The work required a good deal of time and skill. For the purpose of taking one particular view he had to purchase a special short-focus lens. To get some of the pictures special platforms had to be provided, and these were put up by Mr. Kerr's own men. He submitted the pictures to Mr. Kerr in rough proof form, so that defendant could say what should be blocked out and what left in. Witness followed Mr. Kerr's instructions on these points, and when the finished prints were submitted he asked Mr. Kerr whether they were satisfactory. Mr. Kerr replied, "Yes, quite." It was never till now suggested that the photographs were no use, and he heard nothing derogatory about them until the beginning of this year.

Reginald Herbert Scott, of Birmingham, a photographer with twenty-five years' experience, gave evidence in support of the claim. Many of the photographs, he said, were exceptionally good, and as a whole they were all good commercial photographs for the purpose for which they were taken. In cross-examination, however, he admitted that he had not seen the machinery the subject of the pictures.

This concluded the plaintiff's case.

The defendant, in the witness-box, stated that in 1916 the Hereford Corporation, to which he was electrical engineer, arranged with the Ministry of Munitions to make extensions to the electrical works to supply current to No. 14 National Filling Factory. Owing to the exigencies of the war there was no time for plans to be prepared

in the ordinary way, and he decided to have photographs taken to illustrate the work done to put before the Ministry. He engaged Mr. Tucker to supply the photographs, and told him he wanted the machinery taken in clear detail to send to the Ministry; the photographs had also to be deposited with the Local Government Board. He asked Mr. Croot Tucker if he had ever done any photographs for reproduction in technical journals, and he said "Yes." Witness said, "Then you understand what we want." Witness stipulated that the order was to be executed by June 17, as by that date he had to submit a report to the Ministry justifying the expenditure. The expenditure at the works amounted to £96,000, involving twenty-nine different contracts, and he had to account to the Ministry for every detail. He recognised when ordering the photographs that there were difficulties from the photographic point of view, but the staff afforded plaintiff every facility in regard to erecting platforms and in other ways. Mr. Tucker undertook the work, but did not deliver the photographs in time to be incorporated in his report to the Ministry; they therefore were useless to him. But as they had been taken he thought perhaps the firms having contracts on the works would like photographs of their different pieces of machinery and that these might do. So he wrote and asked them in Mr. Tucker's interests. Apart from late delivery, the photographs were useless for the purpose for which he wanted them, as they did not show the machinery in sufficient detail, and it would have been a "discreditable production" for him to incorporate in his report.

Wm. Geo. Osborne, electrical engineer for the Brush Electrical Engineering Company, Loughborough, one of the contracting firms in the Hereford electrical extensions, gave evidence for the defence, saying that plaintiff's photographs of his firm's machinery were of no use to engineers, as they did not show important details and the relative positions of vital sections. Photographs like those shown him by Counsel (taken by another photographer) for comparison would, he said, be useful to an engineer.

Mr. Whitfield submitted that in this case there was an implied warranty under the Sale of Goods Act which had not been complied with, because the photographs were not reasonably fit for the purpose for which they were required.

Mr. Bosanquet replied that the photographs were accepted by the defendant, were not sent back, and nothing was said about them not being fit for the purpose for which they were required until long after the bill was sent in.

The Judge, in giving a decision in favour of plaintiff, said he could not accept defendant's contention that the photographs were too late; he never wrote a letter which he could produce complaining that they were not in time. He accepted his statement that he would have liked to use them on June 17, but he could not hold that that formed part of the contract. The other defence to the action had caused him more difficulty, because of conflicting expert opinions. On this point, however, he had come to the conclusion that they were fit for the purpose for which they were required so far as those requirements were expressed at the time the contract was entered into. Defendant was accepting delivery of the prints over a long period without objecting to them, and he could not now expect the Court to take the view that they were useless for his purpose.

Judgment was entered for plaintiff for the amount claimed with costs.

Legal Notices.—Notice is given of the dissolution of the partnership between William James Davis and Louis Arbus, carrying on business as photographers at 10, Preston Street, Brighton, under the style of Arbus and Davis. All debts due to and owing by the late firm will be received and paid by W. J. Davis, who will carry on the business.

Notice of intended dividend is given in the failure of Charles Frederick Siedle (trading under the style of Siedle Bros.), photographer, 60, Walter Road, Swansea, and 13, Heathfield Street, Swansea. August 2 is the last day for lodging proofs with the Official Receiver (Mr. Henry Rees), Government Buildings, St. Mary's Street, Swansea.

Notice of intended dividend is given in the failure of Joseph Edmund Bramwell, photographer, lately carrying on business at 124, Westborough, Scarborough. Proofs must be lodged on or before August 9 with Mr. D. S. Mackay, Official Receiver, 48, Westborough, Scarborough.

NEW COMPANIES.

Mawson Co., Ltd.—This private company was registered on July 17, with a capital of £20,000 in £1 shares (10,000 pref.). Objects: To carry on the business of manufacturers and dealers in all kinds of photographic dry plates, films, and papers, photographic chemicals, collodions, collodion emulsions and varnishes, photographic apparatus, surgical, optical, and dental instruments, etc., and to adopt an agreement with D. Blount and W. H. Bacon. The subscribers (each with one share) are:—D. Blount, 59, Brighton Grove, Newcastle-on-Tyne, photographer; A. Payne, 49, North Parade, Whitley Bay, chemist. The first directors are D. Blount and W. H. Bacon, 7, Eslington Terrace, Newcastle-on-Tyne (both permanent), and A. Payne. Qualification, 100 ordinary shares. Registered office, 81, Northumberland Street, Newcastle-on-Tyne.

London Etching Co. (1919), Ltd.—This private company was registered on July 21, with a capital of £3,000 in £1 shares (1,500 pref.). Objects: To adopt an agreement between the London Etching Co., Ltd. (in liquidation), and this company, and to carry on the business of colour process and half-tone and line engravers, photo etchers, stationers, printers, lithographers, stereotypers, electrotypers, photographic printers, etc. The subscribers (each with one share) are:—G. W. W. Wright-Nooth, 16, Cranbourne Gardens, Temple Fortune, Golders Green, N.W.4, artist; W. L. McNay, 2, Scarsdale Terrace, Kensington High Street, W., photo engraver. Directors:—G. W. W. Wright-Nooth and W. L. McNay (permanent joint managers). Qualification, £100. Registered office, 3, Holborn Place, High Holborn.

Aerial Photos, Ltd.—This private company was registered in Edinburgh on July 18, with a capital of £18,000 in £1 shares. Objects: To carry on the business of (a) aerial photography, including cinematograph films; (b) aerial passenger transit; and (c) commercial aerial advertising, etc. Agreement with Captain R. S. J. B. Andrews, Major C. H. C. Smith, and Captain O. Hardie. The subscribers (each with one share) are:—H. E. Haig, Clayton, Dairsie, Fife, paper maker; A. R. Wilson Wood, 7, Abbotsford Crescent, St. Andrews, Fife, gentleman; L. W. Allen, 77, Station Street, Coventry. The first directors are Captain R. S. J. B. Andrews, C. H. C. Smith, and O. Hardie. Registered office, 81a, George Street, Edinburgh.

News and Notes.

Doncaster Camera Club.—All communications should be addressed to Mr. J. Tremayne Blackshaw, 38, Hall Gate, Doncaster.

Mr. J. Rubin, 241, Old Kent Road, S.E., writing in reference to the report on page 383 of our issue of July 4 last, of an alleged fire, asks us to make a correction. He informs us that the slight damage done to the premises was by smoke from an outside source, there having been no fire within the building.

"The Professional Photographer" for July contains illustrated interviews with Mr. J. R. Browning, of Exeter, and Mr. Leon Levson, of Johannesburg. An article by Mr. F. C. Tilney offers some suggestions on the eternal question of expression in portraiture, whilst the advertisement pages of our Kodak contemporary are devoted chiefly to new introductions in folder mounts.

Stolen Sanderson Camera.—Messrs. Houghtons, Limited, notify us that a half-plate Tropical Sanderson camera, No. 24877, fitted with a Ross Homocentric lens, Nos. 83794 and 16357, in Koilos shutter, was stolen in Commercial Road, London, E., from a van belonging to Messrs. Ford, the carriers. Messrs. Houghtons will be grateful if any dealer to whom the outfit may be offered will communicate with them.

Stolen Butcher Cameras.—Messrs. W. Butcher and Sons, Limited, Camera House, Farringdon Avenue, London, E.C.4, advise us that two watch-pocket Carbine cameras, Nos. 69,409 and 64,920, were stolen from their premises last week. The cameras are fitted with Aldis Uno lenses in Lukos II. shutters. Notification of the theft has been made, and any dealer having the cameras offered to him for sale will oblige Messrs. Butcher by communicating with the police.

A "Beautiful Richmond" Competition.—The Richmond Camera Club are organising a competition in which money prizes from five guineas to half a guinea are offered for the best set of six prints illustrating the beauties of Richmond, Surrey. The set must not include more than one print of a subject in Kew Gardens. The competition is open, without entrance fee, to any photographer, either professional or amateur. Entry form and further particulars may be obtained from the tressurer of the Richmond Camera Club, 61, George Street, Richmond. The latest date for the receipt of prints is October 11.

Messrs. Johnson and Sons, of 23, Cross Street, London, E.C.2, advise us that they still have a few vacant dates for the illustrated lecture by their representative on "Photography in the War," for the 1919-20 session. The lecture deals with photography in its application to air, naval, and field warfare, hospital work, recreation, etc., and is illustrated by over 100 slides. Messrs. Johnson are also prepared to give either of their other demonstrations, "The Art of Developing" and "Printing Processes," before photographic societies. Any secretary who wishes to book any of the abovementioned three fixtures is asked to make application without delay.

The "Times," which, as is known, has interested itself for several years past in the use of rotary photogravure for newspaper illustration, has now begun to issue, as a supplement to its weekly edition, an 8-page sheet of photogravure reproductions of topical photographs. The issue in which this feature started was that of July 25, and the illustrations appropriately give prominence to the peace celebrations in London of July 19. The technical quality of the rotogravure supplement is of a very high order, and the new feature will undoubtedly do much further to recommend the weekly edition of the "Times" to its many readers throughout the world, who for many years past have found its text pages the most valuable means of following the course of events in England and the European continent.

Mr. William Marshall, of Henley-on-Thames, has, through Messrs. Abbott, Booty and Company, disposed of his old-established business carried on there to Mr. George Bushell, late partner of Bushell and Pritchard, of Winchester. The business is one of a specially interesting kind, from the fact of Mr. Marshall having installed his own electric lighting plant and thus offering the facilities of electric light portraiture in a town without any electric public service. Mr. Marshall had also introduced many ingenious labour-saving devices for printing and enlarging, of which a description appeared in the "B.J." of March 30, 1917. The little town of Henley can hardly be called a focus of business except for the month or two of the river season, but Mr. Marshall's enterprise supplies a useful object-lesson to photographers of what can be done by the energetic adoption of modern facilities.

Correspondence.

**** Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

**** We do not undertake responsibility for the opinions expressed by our correspondents.*

A PROFESSIONAL PHOTOGRAPHIC ASSISTANTS' ASSOCIATION.

To the Editors.

Gentlemen,—I would like to emphasise the concluding remarks in Mr. Aspden's letter in your issue of the 18th ult., but at the same time fail to see how such an asociation will benefit by the patronage of the master photographers' associations.

The very name of the latter society savours of arrogance, and if my experience of being employed for the last eight years by a very prominent member of that association goes for anything, then the less assistants have to do with that body the better it will be for them.

Whilst it is very desirable, in these latter days, for assistants to have a union, and personally I hope such an association will be formed, I await with lively anticipation the first crossing of swords with the august "Master Photographers' Association."—Yours faithfully,

Experience.

CO-OPERATIVE HOLIDAY CLOSING OF STUDIOS.

To the Editors.

Gentlemen,—It may interest your readers to know that most of the Northampton and district photographers have agreed to close their studios during the ensuing Bank Holiday week. It will be remembered that the Northampton photographers were the pioneers in this movement, and that in the two previous years of combined closing the arrangement has been mutually satisfactory to both employers and assistants. Things have not worked quite so smoothly this year owing to the aloofness of one of the leading craftsmen and a prominent member of the P.P.A., who, for reasons best known to himself, has given us no clue of his intentions. However, almost all of us are acting quite independently of whether he opens or not, and hope the public will take due notice. The response of the district photographers in such places as Kettering, Wellingborough, Rushden, and Wolverton is very encouraging, and the bulk have decided to close until the Friday, and some all the week.

If photographers can combine on this matter, why not on others quite as important affecting the status and progress of the profession? Are the P.P.A. Council alive to their responsibilities of sagacious leadership?—Faithfully yours,

S. H. Greenway.

27a, Abington Street, Northampton.

STEREOSCOPIC PHOTOGRAPHY.

To the Editors.

Gentlemen,—As many readers may have had their interests in this subject revived by the articles of C. E. B. which you have recently given us, I send you a drawing of the simplest form of stereoscope probably ever made. I bought it several years ago for a few pence. It was patented, I think, but the patent has probably

Fig. 1.

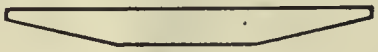


Fig. 2.

run out long ago. It consists of a small piece of plate-glass, shown in plan in Fig. 1. The central division is blackened, and the ends are bevelled (and polished). The flat side is held towards the picture at a distance of about 3 inches from the eyes. Fig. 2 is a section.

Travers J. Briant.

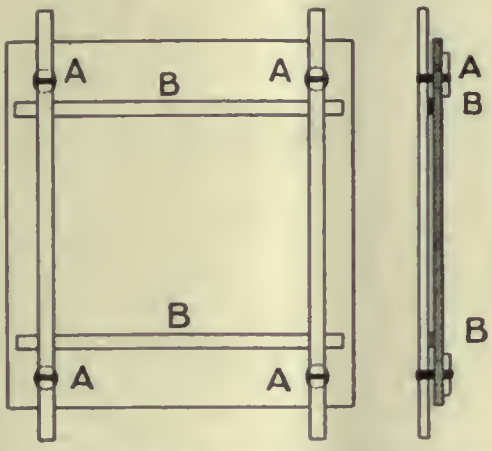
Epsom, July 18, 1919.

A HOLDER FOR BROMIDE PAPER ON THE ENLARGING EASEL.

To the Editors.

Gentlemen,—Some time ago one of your subscribers gave us, through your columns, a device for holding the bromide paper when enlarging. Doubtless you will remember the idea; it was some umbrella ribs at each corner of the enlarging screen made to draw in and out. I tried this, but the ends projected, and were somewhat in the way, so I enclose another very simple idea which I have adapted as it answers well for all sizes. After deciding what size you wish your largest enlargement to be, you make a hole right through at each corner of your screen carrying the bromide paper, as per sketch. Then push through a strong elastic band on the back of the screen, place a piece of wood through the elastic band projecting out of the hole, and on the other side insert the rod to hold the

brass bar which holds the paper in position just where you want it by raising it up or down according to the size. The same is done both sides of the screen. Four elastic bands will be required, one



for each hole. The enclosed sketch will, I think, explain itself. BB are the crossbars, and AAAA elastic bands passed through the holes in the easel.—Yours faithfully,

G. H. Eustace.

306, Cleethorpe Road, Grimsby.

METAL DISHES FOR THE HYPO-ALUM TONING BATH.

To the Editors.

Gentlemen,—With reference to your opinion expressed in the "British Journal," May 22, 1919, page 287, that "no metal dish is immune from liability to give spots in hypo-alum toning," and that "we should view a lead-coated dish with suspicion," we have made a number of experiments to determine whether it is possible to use metallic lead in contact with a hypo-alum toning bath, and find that a bath which has been left in intimate contact with pure lead for one week is almost useless, being far slower in action than the normal bath, and also giving stains particularly on the backs of the prints. From our experiments it is apparent that the presence of metallic lead causes additional reactions which can possibly be represented by the following equations:—

1. $Pb + S \rightarrow PbS$

2A. $Pb + Na_4Ag_2(S_2O_3)_3 \rightarrow 2\,Ag + Na_4Pb(S_2O_3)_4$

2B. $Na_4Pb(S_2O_3)_4 + H_2O \rightarrow 2\,Na_2S_2O_3 + H_2SO_4 + PbS$

There is little doubt that the metallic lead is continually converted into lead sulphide, while the dissolved silver salt (present normally in a hypo-alum bath) is changed to metallic silver or silver sulphide.

In general it would appear that any metal which combines at all readily with "nascent" (in this case a microscopic and incipiently colloidal) sulphur or which displaces silver from its thiosulphate-complex solution, is not suitable as a container for hypo-alum toning baths.—Very truly yours,

E. R. Bullock,
J. I. Crabtree,
Research Laboratory, Eastman Kodak Co.

Rochester, July 10.

[We have it on the authority of one of the largest makers of toned prints that a dish of pure tin is quite satisfactory for the hypo-alum toning bath.—Eds. "B.J."]

PLATE TESTS—A SUGGESTION TO THE R.P.S.

To the Editors.

Gentlemen,—The R.P.S., in its endeavours to be a greater power among photographers, might take a hint from the R.A.C., who before the war conducted stringent tests of motor cars and accessories, finally issuing certificates. The conditions under which these trials were carried out were such that a good certificate was of great advertising value. In addition, the fairness was such that no firm would have a chance in a libel action. My suggestion is that the R.P.S. should do something of the same sort for photographers, making a start with plates and papers. Perhaps later it might be found possible to devise some camera tests. Plates could be tested for gradation, latitude, and keeping quality. For the first we might have an actinometer with about 40 graduated tints from plain glass to complete opacity. A plate capable of rendering 25 tints, for example, would have its gradation registered as 25, and so it would be very easy to compare plates by this simple system.

The last test is what interests me most of all, and to show why I will give a short extract from my photographic life. In 1915, gulled by the advertisements of a plate firm, I bought 12 dozen plates to take to Madeira. Alas! they soon faded away under the sub-tropic heat, while a friend with a different brand went on merrily snapshotting. The scene now changes to the winter of 1918, when I arrived in North Russia, armed with three makes of plates—self-screen, Wratten, and Paget panchromatic. I met there a gay young amateur, who had come out a month before. Yes! he was going to show me how to take photographs; at once challenged me to produce a better negative, etc. Naturally I was interested to know what make of plates such a redoubtable opponent was using. Oh, the best in the world—XYZ plates. These XYZ plates were that brand that had let me down in Madeira. Now the fun's going to begin, I thought. It was not long before he borrowed my darkroom and developed his Murmansk exposures. Horrid, thin, smoky negatives, with a deep stain round the edges. We put this down to the sea voyage and absence of the sun. However, things got worse. When circumstances combined to produce a reasonable negative it was always disfigured by pinholes and a dirty appearance. We made careful comparative trials, exposing and developing two makes at the same time, and the inferiority of XYZ plates was very marked. The three brands of plate I have chosen are going on giving good results, in spite of the great variation of temperature that they have been through—i.e., from Arctic cold to the short, fierce summer, which is almost sub-tropical in its intensity. I forgot to mention a speed test; also we should expect a few remarks on the tendency to frill, pinholes, etc.

The technical part of the tests could be worked out and performed without looking for a reincarnation of Hurter and Driffield. I can imagine a neat row of incubators for plates undergoing the "keeping" test; and what more interesting than to see the condition of the operator as he comes out of the special tropical darkroom? One of the conditions for test would be that the plates must be bought by a private buyer, appointed by the society. Once the plates are bought the trial would have to be carried out and published, so that if the buyer happened to get hold of a stale plate vendor there might be some sporting by-play between the makers and vendors, all toning up the trade for the benefit of the user. Gaslight paper tests on these lines would probably provide a lot of fun.

Cameras would be tested for the following:—

(1) Parallelism of lens with plate.
(2) Registration of ground-glass with sensitive surface, any inaccuracy being measured and noted on the certificate.
(3) Accuracy of focussing scale.

I have no doubt that some such trials would add enormously to the prestige of the society.

H. E. Rendall.

H.M.S. M25, c/o G.P.O., London.
July 6.

The Imperial Handbook, 1919.—The little annual miscellany of notes and articles which year by year makes its own welcome among the pieces of technical reading for the amateur photographer, is just issued by the Imperial Dry Plate Company, with the warlike Imperial lion relegated to a minor position on the back cover and the front occupied by a design symbolical of the new age of peace and justice. An immense golden sun is, we hope, rising, although it is difficult to determine the artist's intention of its position in reference to the Nelson statue which towers above it. The beginner in photography, and many of the experienced, for the matter of that, will accord a profitable reading to the notes on child portraiture, the pyro-soda developer, the making of enlargements, and other subjects which occupy the pages of the Imperial annual. A copy may be had on application to the Imperial Dry Plate Company, Cricklewood, London, N.W.3.

Answers to Correspondents.

SPECIAL NOTICE.

In consequence of general reduced supplies of paper, as the result of prohibition of the importation of much wood pulp and grass, a smaller space will be available until further notice for replies to correspondents.

Moreover, we will answer by post if stamped and addressed envelope is enclosed for reply: 5-cent. International Coupon, from readers abroad.

The full questions and answers will be printed only in the case of inquiries of general interest.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

J. E. C.—We think Mr. R. E. Peeling, 4-6, Holborn Circus, E.C., would be able to make an effective repair of your shutter.

C. C.—All postal censorship has now been removed, so that you are at liberty to send any photographs to neutral countries, and, we believe, also to previously enemy countries.

N. E.—Ferro-prussiate or white-line paper can be quite easily made (see formula in the "Almanac"), but the other papers, such as ferro-gallic, are not within the scope of home preparation, and even if you want to make ferro-prussiate in large quantity you will have to put down a coating machine since hand application of the sensitiser would be a very laborious job.

J. G.—Almost certainly the mischief will be done by the time the enlargements have been mounted. This is bound to be the case if the cause of the fading is incomplete fixing, and in all probability will also be the case if the fading is due to impure mountant or mounting board. These are two most common causes of fading. There is really no benefit in refixing after enlargements have once been mounted.

G. M.—The photograph is probably either a collodion positive or a Daguerreotype. In either case it is very delicate and most easily damaged. It may be possible to restore it, but the best thing you can do is to send it to a professional restorer, such as Mr. Charles Debenham, 222, West End Lane, Hampstead, N.W. If it is not capable of restoration then your best course would be to have it sent to an expert copyist such as Mr. Stewart Bale, 53, Lord Street, Liverpool.

H. E.—Perhaps the best thing we can do is to send you a copy of the schedule of prices issued last month in a revised form by the Photographic Dealers' Association. This is as follows:—

	Developing. Each	Printing. Each
3½ x 2½ (or smaller)	1d.	2d.
No. 1a F.P.K., No. 2 F.P.K. (4¼ x 2¼)	1½d.	2½d.
No. 3 F.P.K. (¼-pl.) and No. 2c Kodak	2d.	3d.
No. 3a F.P.K. (postcard) and 5 x 4 ...	2½d.	3½d.

W. H. S.—We are sorry we have no particulars of the current consumption of the Cooper-Hewitt M pattern lamp, but the consumption of all mercury-vapour lamps is small. A single-tube suitable for contact printing has a consumption of 385 watts, equivalent to about three farthings per hour with current at 2d. per unit. A two-tube outfit suitable for copying has about double this consumption. The light is a very good one indeed for copying, and is less likely to show grain than any other artificial light. We are quite sure if you apply to the Westinghouse Cooper-Hewitt Company, 80, York Road, King's Cross, London, N., they will inform you as to the consumption of the M tube.

C. J.—1. The only celluloid letters we know of which can be arranged for photographic titles are those sold with the sets of announcement frames now much used by shops and others. You can get these from the Tress Company, 4, Rathbone Place, Oxford Street, London, W.1., or from a firm of shop fitters, such as Messrs. Sage, of Gray's Inn Road, London, W.C. But the professional method of making titles is to set up the title in type and then photograph a proof. This is bound to give a very much better result than photographing solid letters, the lighting of which calls for special care. 2. The ordinary slow process or photomechanical plate must be used, and if developed with, preferably, hydroquinone will give a quite clear line on an intense black ground. Almost every maker has a process plate, and there is very little to choose between them.

J. E.—The best description of lens for outdoor portraiture in half-plate size is one of about 10-in. focal length and of aperture at least *f*/6, and, better, *f*/4, although the latter will be of very little advantage in making photographs of buildings, as almost always it will be necessary to stop it down. But it is very doubtful if your lens front will take so large a lens. All three makers which you mention are first-rate, but you will not be able to get a new lens either by Cooke or Ross of 10-in. focal length for the price you name. You can get this with the Aldis, and possibly an *f*/6 10-in. Aldis would be small enough to go on your lens front. Alternatively, your best course would be to state the maximum lens flange you can fit to your camera and ask a firm of dealers in second-hand lenses to say what lenses they can offer you of about 10-in. focal length, saying that you want the largest aperture, within the limit of your price, that your lens front will take.

H. H.—1. A whole-plate adapter for a half-plate camera is a clumsy kind of makeshift, and you had far better have nothing to do with it. Unless we know the focal length of your Beck lens it is impossible even to guess whether it will cover a whole-plate. It ought to be of at least 10 ins. focal length to do so satisfactorily. With suitable lenses you ought to get on just as well with a half-plate camera, enlarging to whole-plate when necessary. For a lens of anything over 8-in. focal length we should call *f*/16 a reasonable aperture, since most subjects would require stopping down almost to this for the sake of depth. 2. There is no objection to keeping used metabisulphite-hypo fixing baths in use for a day or two. Certainly most of the fixation takes place in the first bath, but prints should not suffer through receiving this first fixing in a bath which has already been used to some extent. 3. If fixing has been thorough, washing in three or four changes of water for, say, three minutes in each is ample if the negative is not to be kept longer than, say, three months.

The British Journal of Photography.

The Oldest Photographic Journal in the World.

PUBLISHED EVERY FRIDAY. ESTABLISHED 1854. **PRICE TWOPENCE**

TERMS OF SUBSCRIPTION, POST FREE.

UNITED KINGDOM.—One Year, 10s. 10d.; Six Months, 5s. 5d. Three Months, 2s. 9d.

CANADA ... ...
AUSTRALIA ... ...
NEW ZEALAND ... ...
SOUTH AFRICA ... ...
UNITED STATES OF AMERICA
SOUTH AMERICA ... ...
INDIA AND FAR EAST ... ...
CONTINENT OF EUROPE ...

One Year. Thirteen shillings (13s.), or 3 dollars 17 cents, or 18 francs 50 cents, or 9 rupees 12 annas, or 6 yens 30 sens.

FEDERATED MALAY STATES, BORNEO AND SARAWAK 5 dollars 57 cents.

HENRY GREENWOOD & CO., LTD., Proprietors and Publishers, 24, Wellington Street, London, W.C.2.

IMPORTANT NOTICE TO READERS.—Until further notice agents will supply the "B. J." to order only, as the high price prevailing for everything in connection with newspaper production prohibit the distribution of surplus copies for chance sales. It is therefore necessary in order to ensure the regular delivery of the "B. J." each week to place an order definitely with a dealer, newsagent or bookstall clerk, or to send a subscription to the publishers.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3092. Vol. LXVI. FRIDAY, AUGUST 8, 1919. Price Twopence.

Contents.

	Page
Ex-Cathedra	449
Lens Apertures	450
Chromium Intensification with Chlorochromates. By A. and L. Lumière and A. Seyewetz	451
From Studio to Home Portraiture. By Charles H. Davis	455
Practicus in the Studio. By Practicus	456
How to Increase Production and Reduce Selling Prices of Photo-Engraving. By A.J.N.	457
The British Photographic Research Association	458
H.M. the Baby	458
Assistants' Notes	459
Photo-Mechanical Notes	460
Patent News	460
Analecta	461
Meetings of Societies	461
Commercial and Legal Intelligence	462
Correspondence— Dishes for Hypo-Alum Toning—Co-Operative Holiday Closing of Studios — An Assistants' Professional Photographic Association — How's This for Profiteering	462
Answers to Correspondents	463

SUMMARY.

The attention of senders of small prepaid advertisements is particularly directed to the necessity of complying with the conditions of insertion, the chief of which are mentioned on page 450.

MM. Lumière and Seyewetz, in a paper on chromium intensification, have pointed out that the process can be carried out quite satisfactorily by means of an alkaline chlorochromate in place of a mixture of bichromate and hydrochloric acid. The chlorochromate supplies the means of making a dry powder to form the intensifier by dissolving in water. The authors have further studied the chemical process of chromium intensification. (P. 451.)

Mr. Charles H. Davis, well known as a leading New York professional photographer, has very freely and frankly stated his experience and methods in the practice of at-home portraiture. (P. 453.)

In his article this week "Practicus" deals in a general way with the lines which require to be followed in undertaking work, such as the photography of workshops, etc., away from the studio. (P. 456.)

A contributor draws attention to the systematic means which may be taken for obtaining orders for portraits of babies. (P. 458.)

In a leading article we offer some simple advice to those who have a difficulty in finding for themselves the working aperture of a lens. (P. 450.)

Expedients, temporary and otherwise, for replacing a broken focussing screen are the subject of "Assistants' Notes." (P. 459.)

A paper by Mr. A. J. Newton before the Convention of the American Photo-Engravers' Association discusses the possible means of increasing production and reducing the selling price of photo-engraved blocks. (P. 457.)

Tested methods for the photographic printing of designs, etc., on wood to be hand-engraved are given in "Photo-Mechanical Notes." (P. 460.)

Extracts from a report of the British Photographic Research Association mention that the method of staining wood black or grey throughout its substance has been successfully worked out. (P. 458.)

The Ministry of Labour, after having excluded photographic studio businesses from the operation of the Retail Business (Licensing) Order, has now included them. The remedy, unfortunately, comes too late to prevent the harm which has been done many demobilised men. (P. 449.)

The Board of Trade have published their classification of photographic goods according to freedom or otherwise of importation into this country (P. 450.)

EX CATHEDRA.

Chromium Intensification

The paper by MM. Lumière and Seyewetz which appears on another page, and is a sign, we hope, that these investigators can now look forward to a resumption of their pre-war type of research, is a contribution to chromium intensification which derives its chief interest from the prominence given to the use of chlorochromate in place of a mixture of bichromate and hydrochloric acid as the bleaching solution. To the best of our knowledge MM. Lumière and Seyewetz are the first to publish the use of chlorochromate for this purpose, although we believe they are not the first to use it. According to our information chlorochromate has been used for some years past in the manufacture of the chromium intensifier in tablet or powder form for which the employment of a liquid acid is out of the question. A crystalline salt like potassium or ammonium chlorochromate conveniently serves the maker of photographic tablets as a substitute for bichromate and hydrochloric acid just in the same way as sodium acid sulphate is used as a substitute for sulphuric acid in preparations which require this latter liquid. While chlorochromates remain unpurchasable, the amateur user will prefer to make up his bleaching bath for the chromium intensifier in the accustomed way, and at the same time obtain a certain range of intensifying action by varying the proportion of bichromate to acid.

* * *

The Retail Business (Licensing) Order.

A good deal of confusion has been caused by the attitude of the Ministry of Labour in the administration of the Retail Business (Licensing) Order introduced in 1918 and designed for the very excellent purpose of protecting the interests of men who had been absent on military service. In the absence of any intimation of special exception it was natural to assume that the business of portrait photography would come within the terms of that Order, for the reason that portrait photography is taken as a business by the Inland Revenue, by the Shops Act, and by the Business Names Act. On that assumption we advised those to whom the Order applied that they came within its scope. After a time it was discovered from individual cases that, as administered by the Ministry of Labour, the Order did not apply to photographic studios, or rather applied to them only when photograph frames and other goods were sold by the portrait studio. The distinction was obviously a stupid one, since frames are sold by most studios, but, on the other hand, it provided a loophole of escape for people who were setting up portrait businesses in places where photographers, absent on military service, have been obliged to close down. As a result of a question asked in the House of Commons by Sir Rupert Guinness, we now learn that Sir Robert Horne has taken the decision that the owner of a photographic studio is engaged in carrying on a retail business within the

terms of the Order, even when his work is confined to the production and sale of photographs to private individuals. It is stated that instructions are being issued to officers charged with the administration of the Order to apply it in this sense. The amendment unfortunately comes too late in the day to remedy the injustice which has been done in many cases where men have returned to re-establish their studios, only to find that new portrait businesses had been started, through the stupid administration of the Order, in places within the absentees' circle of customers.

* * *

Intensive Hardening of Gelatine. The particulars given in the patent specification on another page of the composition of the hardening bath, which has already been placed upon the market as the Ilford Tropical Hardener, suggest that the hardening qualities of formaline are very greatly intensified by the presence in the solution of a salt which retards the swelling of gelatine in water. Without having tried it, we should not expect the addition of even the considerable proportion of sodium sulphate to a 1 : 40 formaline solution to produce the remarkable degree of hardening which is exhibited by the Ilford preparation. It would seem that in some way or other a more powerful effect is produced by the conjunction of two, although it is obviously very difficult to say what it can be. At any rate the invention should prove a boon to users of plates or film in tropical countries and still more so on account of the fact that the preliminary bath may be used in conjunction with any formula of developer, and therefore leaves the photographer free to follow his own preferences in this latter respect.

* * *

Prepaid Advertisements. Senders of prepaid line advertisements who may have had occasion to be disappointed by the non-appearance of their announcements in the succeeding issue of the "British Journal" are asked by our publishers to give their attention to the following points, failure to observe one or other of which is the cause of the non-appearance of advertisements in the great majority of cases. These points are:—

The advertisement must be fully prepaid. A schedule showing how the price of an advertisement can be reckoned correctly is sent on application.

Instruction to repeat a previous advertisement must be accompanied by the previous announcement, and must be fully prepaid.

Advertisements are not accepted by telephone or telegram.

In addition, senders of small advertisements are particularly requested to write on one side only of the paper and, whenever possible, to post their advertisement not later than Monday in the week for Friday's publication. These advertisements can be accepted up to Wednesday noon, but if the majority of advertisers postpone sending their announcements until the latest permissible time it is almost inevitable, from the exigencies of "making-up" the pages, that some require to be held over.

* * *

Imports of Photographic Goods. A supplement to the "Board of Trade Journal" of July 31 consists of a consolidated list of import restrictions authorised by this department of the Board of Trade, 22, Carlisle Place, London, S.W.1. Articles are specified in this list, in one or other of two sections, according as they may be imported with or without licence. In the latter category (Part I. of the list) are included the following photographic requisites:—Camera shutters, cinematograph cameras, ferrotype plates, and positive papers, the latter presumably the papers or cards for direct portraits in the camera; also photographic gelatine. During the war all these goods have been upon the list of articles importation of which was prohibited by general licence, but they may now be imported from any country, including Germany and German-Austria. The section (Part II.) of the list which itemises goods which may not be imported without licence from places outside the British Empire includes all photographic apparatus, with the exception of those just mentioned. Licences will be issued for the importation of goods to the amount of 33⅓ per cent. of the 1913 imports. A further class of goods coming with Part II. is "cameras fitted with lenses." No ration for these being stated, it is to be understood that their importation will be licensed only exceptionally as and when required. The schedule gives special prominence to the announcement that licences issued for goods are not available for goods of German or German-Austrian origin unless the contrary is expressly stated therein.

LENS APERTURES.

The system of marking lenses with what are generally called f/values has now become almost universal, and practically all modern instruments have the diaphragm scale so engraved. The only notable exceptions are some American lenses of which the apertures, while conforming to the standard openings, are marked with figures which express not the relation of aperture to focal length but the relative exposures necessary. These may be recognised by the fact that starting with the largest opening, the number is doubled at each step. There is only one number which is identical and common to both systems and that is 16, which is also $f/16$ in the more usual notation. We draw attention to this because many Kodak owners who have lenses marked with the full aperture as 4 imagine that it indicates $f/4$, and consequently give much shorter exposures than they would do if they knew that in this case 4 is only equivalent to $f/8$, while on the other hand they are likely to over-expose and also to be disappointed in the depth of field obtained when using the aperture marked 32, which corresponds to $f/22$. Once this is realised it is perfectly easy to reckon backwards or forwards from number 16 when the f/values are easily found.

In the past there has been a multiplicity of diaphragm systems, while in a few cases it may be found that the apertures are incorrectly marked. We have found lenses bearing a reputable name which, purporting to have a full aperture of $f/8$, had one no larger than $f/10$, which would require an exposure of half as much again. On the other hand, we have heard of a photographer wrongly imputing misrepresentation on the part of an optician because according to his measurements a lens said to have an aperture of $f/6$ appeared to work at nothing larger than $f/7$.

It is a matter of some delicacy to ascertain the exact equivalent focal length of a lens, but it is quite easy for the most unscientific operator to obtain a sufficiently near approximation for purposes of exposure. One way is to focus an object so that it appears exactly its own size upon the focussing screen and to divide the distance between the ground glass surface and the original by four, the result being the focal length of the lens used. There is a small percentage of error in the result, but not enough to cause trouble in practical work. A more accurate way is to focus a very distant object, to measure the camera extension carefully, then to focus an object full size, and again measure the extension. The difference between the two measurements is the focal length. Neither of these methods requires any calculation, unless division by four can be so termed, and either will answer the purpose. Having determined the focal length we must find out what fraction of it is represented by any particular diaphragm opening. Here it is not sufficient to measure the diameter of the opening and to divide this into the focal length except in the case of single lenses which have the diaphragm fixed in front. With all others the convergence of the rays passing through

the front combination has to be taken into account, and in some types of lens this convergence is considerable. We have therefore to send a beam of light through the diaphragm from the back and measure its diameter as it emerges from the front lens. This may appear to be rather a difficult task, but it is really quite simple. The first step is to focus a very distant object in the usual way, next to replace the focussing screen by a card or plate of metal in which exactly opposite the centre of the lens and in the same plane as the ground surface of the glass is a pinhole with smooth edges. The camera is now taken into a darkened room and a light held near the pinhole. On the surface of the front lens will be seen a patch of light which represents the *effective* aperture of any diaphragm which is in position. The beam which illuminates the lens front emerges as parallel, and, as will be seen, this facilitates the measurements. A convenient way of carrying out this test is to dispense with the ordinary focussing screen and to make a light board of wood or very thick card which will slip into the grooves in place of the dark slide. In the centre of this a hole about an inch in diameter is cut, and covering this is a scrap of ground glass slipped under the heads of two or three drawing pins, the ground surface, of course, facing the lens. A pinhole is now made in a small piece of metal—ferrotype plate will do—which will slip into the position previously occupied by the piece of ground glass. This pinhole may be illuminated by a small flame—even a candle answers well. Electric filament lamps are unsuitable, as it is difficult to get the filament opposite the pinhole.

As the emerging beam is parallel we can measure it in any convenient plane, and to do this we need a strip or disc of ground glass at least as wide as the lens hood. On placing this in contact with the hood or front cell of the lens we see a brightly illuminated circle, of which the diameter can be marked in pencil on the ground glass to be measured with a rule at leisure. If the whole series of stops has to be checked it is a good plan to start marking the diameters from one pencil mark, that is to say that when the diameter of *f*/8 has been marked on the ground glass, the left-hand mark should be moved up to one edge of, say, the *f*/11 opening, so that only one fresh mark is necessary. This obviates all risk of confusion at a later stage.

It need hardly be pointed out that those accustomed to use the metric system will find it advantageous to disregard the makers' designation of the focal length and to work throughout in millimetres.

CHROMIUM INTENSIFICATION WITH CHLOROCHROMATES.

Intensification with chromium, which was first pointed out by Eder, has been the subject of various papers published by Welborne Piper and Carnegie[1], Sellors[2], Welborne Piper[3], and, more recently, by Bothamley[4]. The formulæ for chromium intensification advocated by these various writers consist in the use of a solution of potassium bichromate with the addition of varying quantities of hydrochloric acid, or in the use of a solution of chromic acid containing an alkaline chloride.

The process takes place in two stages. In the first the image is treated by one of the above-mentioned baths, and in the second this image is developed with an energetic developer such as diamidophenol and soda sulphite or metol-hydroquinone, development being done after a washing sufficient for the removal of all traces of soluble chromium compound.

The advantages which this method of intensification possesses over the processes commonly used consist in the possibility of progressive intensification by means of a succession of the twofold operations of treatment with the acid bichromate solution and darkening in the developer, and in the almost non-poisonous character of the chemicals employed. The series of operations can be carried out without appreciably affecting the transparency of the image and without producing any residual coloured fog, so that the result of four successive applications of the intensifier allows of obtaining a degree of intensification greater than that given by the other processes, and, at the same time, highly permanent in its results.

The various writers by whom the process has been studied have recognised the necessity of using a small and exactly proportioned quantity of hydrochloric acid[5]: if the proportion of the hydrochloric acid is too great, the image bleaches in the bichromate bath, but there is no intensification produced by treatment with the developer. A result of this kind may be ascribed to the redissolving of the chromium compounds in the excess of acid.

It may be assumed that the active intensifying agent is a definite combination of hydrochloric acid and bichromate. Piper and Carnegie[6] have explained the process on the theory of the formation of potassium chlorochromate, a powerful oxidising agent, which, according to these experimenters, converts part of the silver into silver chloride, and fixes chromium on the other portion. Bothamley assumes that the silver of the image reduces the potassium bichromate in presence of hydrochloric acid and gives rise to the formation of chromium sesquioxide, which forms chromic chromate with excess of bichromate. Nevertheless, no experimental proof of these views of the process has been forthcoming, and hitherto the composition of the intensified image has not been known.

We have observed that potassium chlorochromate (a definite compound) dissolved in water without addition of hydrochloric acid forms a good intensifier of silver images. This observation has led us to undertake a study of chromium intensification, using chlorochromates in place of the mixture of bichromate and hydrochloric acid. In the present paper we have sought to set forth the results of our observations on the following points:—

A. The substitution of potassium chlorochromate for a mixture of potassium bichromate and hydrochloric acid in the intensification of silver images.

The suitability of other chlorochromates and of analogous compounds containing bromine in place of chlorine for this process.

B. The theory of intensification with these substances and the composition of the intensified images.

Preparation of Chlorochromates.

We have prepared the potassium, sodium, and ammonium salts by evaporating a strong solution of the corresponding bichromate with a quantity of hydrochloric acid calculated

(1) The "Amateur Photographer," 1904, vol. 40, p. 597.
(2) The "British Journal of Photography," 1904, p. 1074.
(3) The "British Journal of Photography," 1907, p. 3.
(4) The "Photographic Journal," 1918, No. 2, p. 53.
(5) Piper and Carnegie recommend the following formula as that giving the greatest intensification:—Water, 1,000 parts; hydrochloric acid, 1·16 = 20 deg.; Bromide, 2 parts; potass bichromate, 10 parts.
(6) The "Amateur Photographer," 1901, vol. 40, p. 399.

according to the following equation, where M represents the metal—sodium, potassium, or ammonium.

$$\begin{matrix} CrO_2 < OM \\ \quad\;\; O \\ CrO_2 < OM \end{matrix} + 2HCl = 2\,CrO_2 \begin{matrix} \diagup OM \\ \diagdown Cl \end{matrix} + H_2O$$

There are obtained in this way dark brown solutions which, when sufficiently concentrated, yield the chlorochromates in the crystalline form on cooling.

The potassium salt crystallises readily in fine prismatic yields of brilliant orange-red colour, much more soluble in hot water than in cold.

The sodium salt is exceedingly soluble in cold water. It is hygroscopic, and crystallises only with great difficulty.

The ammonium salt is appreciably more soluble than the potassium salt. It crystallises easily on cooling a hot concentrated solution, separating in fine scales of brilliant orange-red colour. These three compounds, which correspond with the general formula

$$CrO_2 < \begin{matrix} OM \\ Cl \end{matrix}$$

possess the same intensifying properties as the solution of potassium bichromate and hydrochloric acid. A solution of 3 per cent. strength serves for the intensification of plates, and one of 2 per cent. strength for intensifying paper prints.

It is remarkable that the potassium salt loses its intensifying properties after having been recrystallised in water, whilst the ammonium salt retains them. This phenomenon is probably explained by the fact that the potassium salt is much less soluble than the ammonium salt, and requires for its recrystallisation a larger quantity of water. It may be supposed that the potassium salt is hydrolised according to the following equation:

$$2\left(CrO_2 \begin{matrix} \diagup OK \\ \diagdown Cl \end{matrix}\right) + H_2O = \begin{matrix} CrO_2 < o\,K \\ \quad\;\; o \\ CrO_2 < o\,K \end{matrix} + 2HCl$$

whilst the ammonium salt is not dissociated in this way.

If in the preparation of chlorochromate we use hydrobromic acid in place of hydrochloric acid, we obtain a dark brown solution which gives off bromine, and which leaves, on cooling, reddish brown crystals. These crystals, after separating and drying, were found to have no action on the silver image. Their composition has not been determined.

Theory of Intensification.

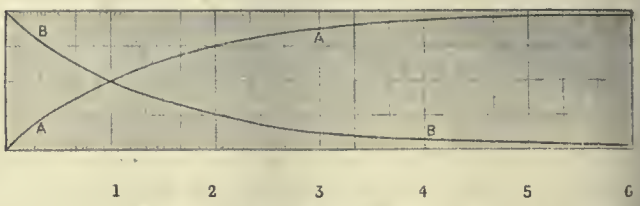
The preceding reactions may be explained by assuming that through the reducing action of the silver image the first stage of the process leads to the formation of a double chromite of silver and an alkaline metal, together with silver chloride, which is reduced to metallic silver by the redeveloper. These reactions may be represented by the following equation:

$$(1)\ CrO_2 \begin{matrix} \diagup OM \\ \diagdown Cl \end{matrix} + 2Ag = CrO_2 \begin{matrix} \diagup OM \\ \diagdown Ag \end{matrix} + AgCl$$

$$(2)\ AgCl + H + Na_2SO_3 = NaHSO_3 + NaCl + Ag$$

We have confirmed the absence of soluble silver from the chromium solution after intensification. The mixture of double chromite and silver chloride which would constitute the image on the completion of the first stage of the process is of brownish colour. This colour becomes more and more pronounced as the intensifying process is repeated, for the reason, no doubt, that the proportion of chromic compound increases, whilst the quantity of silver chloride is reduced. According to the equations given above, the image, after the first intensification, contains only half of the original silver in the metallic state. On a second application of the chlorochromate this half of the silver is again converted into double chromite and silver chloride. The silver chloride is reduced for the second time to the metallic state, the residual silver thus representing only one-quarter of that originally present. It will thus be seen that each successive intensification reduces by one-half the quantity of silver contained in the image in the metallic state, and that after five successive intensifications this proportion of silver will have become so greatly reduced (to 1-32) that it is no longer susceptible to a further increase of density. These results may be shown graphically by setting off the number

Total Silver of Image.



of intensifications as abscissæ and the proportion of silver contained in the image after each operation, either as double chromites and as metallic silver as ordinates. The total quantity of silver contained in the image remains the same. In the diagram the silver in the form of double chromite is shown by the curve A A: the metallic silver reduced in course of intensification and redevelopment is shown by the curve B B. The figures 1, 2, 3 . . . 6 indicate the number of successive intensifications.

Analysis of the Intensified Image.

We have determined the composition of the intensified image by working on two series of plates which were subjected to two and six intensifications respectively in order to compare the quantities of chromium fixed in the two cases. After further washing, the gelatine film was detached from the glass and ignited, to destroy all organic matter. The residue was dissolved in boiling nitric acid and the silver in this solution determined as chloride and the chromium as sesquioxide. It was found that the total quantity of silver was practically the same in the two series, whilst the ratio of the quantity of chromium to the quantity of silver increased appreciably with the number of intensifications. The following were the results obtained:—

—	Ratio of the quantity of Chromium and Silver contained in the Image.	
	After Two Intensifications.	After Six Intensifications.
Chromium, Cr per cent.	33·3	58·5
Silver, Ag per cent.	66 6	41·5

With the object of confirming the correctness of the theory which has been set forth in the preceding paragraphs, we propose to extend these analytical determinations by working on pure finely-divided silver, subjecting it to a series of successive treatments with chlorochromate, and thus determining the composition of the products which are formed before and after treatment with the developer.

Conclusions.

1. The alkaline chlorochromates serve as intensifiers of silver images similarly to alkaline bichromates with addition of hydrochloric acid or chromic acid in presence of alkaline chlorides.

2. The use of chlorochromates allows of fixing by a series of successive treatments, followed by redevelopment, increasing quantities of chromium up to a limit which appears to be reached after six successive treatments.

3. The quantity of chromium which can thus be fixed after six successive treatments is greater than the total quantity of silver forming the image. The latter appears to remain constant.

A. and L. Lumiere and A. Seyewetz.

FROM STUDIO TO HOME PORTRAITURE.

[The title of this article has a two-fold significance, since the contribution is one which represents the views and working methods of one of the leading professional photographers of Fifth Avenue, New York, namely, Mr. Charles H. Davis, in practising his art of portraiture away from the studio. Unfortunately it is not possible to reinforce the advice given by Mr. Davis in the way of reproducing the beautiful examples of his work in home portraiture which accompany his notes in the "Photographic Journal of America." There the reproductions show the effects obtainable by a master of studio portraiture in the more difficult circumstances of sitters' homes.—Eds. "B. J."

A new vista is opening for the portrait photographer. New opportunities, new scenes and new conditions await every excursion into homes, offices or gardens for the purpose of making portraits. The vogue of likenesses made in other places than studios with skylights is a growing one and is already becoming a distinct departure or branch of the portraitist's work. This is being demonstrated beyond question by the fact that some leading professionals are devoting their entire attention to this class of work and establishing successful and growing businesses in this line alone. This makes the consideration of the subject a very interesting one. It is a branch of work that requires special training, involves disappointments and heartburnings, along with the many unique and beautiful results that may be produced. It is the part of wisdom to consider the difficulties carefully, as well as to examine one's self rigorously for the qualities that make for its successful prosecution. It is unwise to imagine that the work is easy; for it is not. Compared with it, portraiture under a skylight is child's play. It used to be said that no operator (for lack of a better word) could go under a strange light and produce the best results; or, in other words, he would have to become accustomed to the varying conditions there before he could find himself and make uniform lightings and correctly exposed negatives. If this be true—and it is largely so—how much more difficult it certainly must be to go constantly into strange places and do successful work.

The factors, therefore, first of all, must be knowledge, wedded to experience, with a large amount of discrimination and tact, resourcefulness, close observation, ingenuity, patience and common sense. Given these qualities, as well as a complete photographic education, politeness, suavity and poise, there is nothing to prevent success.

These qualifications seem exhaustive, but it will be found that the successful ones possess most of them. Without these qualities I should advise the recognition of one's limitations, and continue to work in the studio, for a large measure of success will only come to those whose personal endowment and ability equip them to master the difficulties and disappointments with which the path is so plentifully beset. In passing, let us note that patience and a capacity for hard work are largely matters of self-control. These qualities are very necessary, and may be cultivated. I speak from experience, and know. I have been lauded by clients for infinite patience, but I know in my own heart that I have little of this quality; but with determined self-control I have produced the impression of having it, and perhaps this amounts to the same thing.

Another qualification which is very important is the ability to pose the figure gracefully and give due attention to the arrangement of the hands. If the charm of home settings is to be preserved, the figure must be shown. The environment found in the home will make the picture interesting and valuable.

The phrase "home portraiture" should mean something more than merely a portrait made at the patron's home. It should mean something beyond the stereotyped head and bust representation which has become the major type of portrait produced by the rank and file of the photographic profession. This style of portraiture has degenerated until it has now become a sort of map of the sitter's features, often freakishly and spottily lighted by electric additions to daylight, sometimes over-obscured or befuddled by the misuse of soft-focus lenses, and further distorted by curiously wrought backgrounds supposed to imitate the masterpieces of portrait painting, but really doing violence to their memories and traditions. Since this style took possession of some of our high-priced specialists, a sort of picture has prevailed that may be made anywhere, and is actually produced in any old place, and it is a sort of portraiture that does not reflect a large amount of credit upon the maker or lead to a higher plane of work. The writer hopes, through the growing vogue of "home portraiture," to see a return to sanity in picture-making, and more use of the figure, and once more behold a product that shall not only portray the subjects as they are, but shall, in addition, give them the individuality of their own surroundings. Thus Mr. A.'s portrait shall become quite different from that of his neighbour's, so that Mr. B.'s portrait, when perchance they exchange, will not be identical except for a difference in physiognomy. In short, let us make pictures of people at their homes that shall proclaim them to be at home and at ease among their own individual things.

With this desirable feature in view, the folly of always putting the subject in a predetermined pose or fitting them into a certain style of lighting becomes quite apparent.

My outfit for outside work consists of a 10 by 8 standard make of camera, called "home portrait" by the manufacturer. It uses double holders for plates or films. It is very light, and all the movements, which comprise double swing back and rising and falling front, are quickly and conveniently made by thumbscrews. There is also provision for adjusting the entire front sidewise on the base. The bellows is square, and the front board is large. I use a Thornton-Pickard roller-blind shutter with positive cable release. This shutter can be set for time or instantaneous, and is absolutely reliable, and makes little noise. Mine is attached at the back of the lens outside of the camera, and is removed and placed inside for carrying.

The whole packs closely and is carried in a case with three holders, and lens. For additional holders I have a separate case. The entire outfit when closed for carrying is in three parts—camera, plate-holder case and tripod. The holder case is carried by a shoulder-strap, leaving the hands free for camera and tripod.

There are very convenient but expensive home portrait outfits on the market. The length of one's purse must regulate this outlay. It pays to own a convenient and well-made outfit, and the purchase of such is really an investment. Besides, your client is impressed by a good-looking apparatus.

I use a standard centre-leg tripod of wood that folds compactly. This style of tripod is rigid, can be raised and lowered, has a tilting top, is readily moved about, and will stand anywhere securely. The character of the tripod is of the greatest importance. Much time and temper are lost with the ordinary folding type. It slips at the most inopportune moment, or when engrossed with the subject a chance movement may trip one leg, with disastrous results not only to one's own feelings and temperament, but to those of the sitter. Then all has to be done over again. If the camera has not

been smashed or other minor damage done, much damage has accrued to other things concerned. Not only has one's own equanimity been upset along with the camera, but the subject's already tense feelings are tightened, and there is, to say the least, the devil to pay. Consequently, a few dollars invested in the centre-pillar, spreading-leg, adjustable tilting-top variety are well spent, for such a tripod will stay put and remain constant upon the smoothest wax-polished floor—where perhaps angels fear to tread. So much for tranquillity and certitude. This type is manufactured by at least two different concerns.

As to the lens, for all-round use I have found a Cooke Series VI., 10 by 8, 13-inch focus, *f*/5.6 the most satisfactory for home portrait work. The focal length is not ideal—a longer focus would be an improvement in many ways—but as one has to consider limited working spaces or carry several lenses, the above seems to be the most desirable. It gives a minimum of distortion even on large heads, and it has brilliancy, ample speed, and, if wanted, critical definition. Not even the Hun makers, perfect as their products are, have anything on the English Cooke; in truth, I am confident that it is quite an unequalled product. Of course, a battery of convertible anastigmats would be the criterion of luxurious perfection, but this again involves an extra weight to carry, and I have been in few situations where I felt the need of anything beside my perfect Cooke, which gives, in addition to its exquisite definition, a range of diffusion that enables one to verge on soft-focus effects with every degree between that and positive sharpness. This lens is provided with attachments for cords, enabling one to regulate the diffusion while observing the ground glass; and this I find in practical use a very desirable feature. There are plenty of good lenses, however, and more depends on the user than is generally recognised by those of scant experience. The American-made Velostigmat, 8 by 10, *f*/4.5, is well spoken of, and its 12-inch focus is satisfactory. I would not advise a shorter focus lens. An inch or two more will give far lovelier results, as the perspective is less violent.

I am usually provided with plates or films for eighteen exposures, and, if necessary, an extra package of plates or films, which can always be changed on the spot in any dark closet in the home. I do not find a safe light necessary for changing. In addition to the above, I always carry a twenty-five foot length of strong cord, about a half-dozen spring clothes-pins, a few brads and small nails, and a few sheets of white tissue paper. I always find a reflector in a sheet at the home, and unless I know beforehand that the walls of the home are impossible photographically, I never carry any sort of a background. Thus equipped, I generally am able to secure satisfactory results.

While on the subject of equipment and materials I wish to record the fact that the new portrait films are ideal for home work. They possess qualities besides lightness and freedom from breakage. Halation is reduced to the minimum, and they seem to have both latitude and speed. They are coated with a very superior emulsion. It is to be hoped that the present high prices for them may be somewhat reduced in the future. This is the principal objection to their more general use.

I do not carry or recommend the use of an electric light except in emergency cases. It savours too much of taking the studio to the home. An adequate equipment for artificial lighting would need a truck or at least an automobile. The use of electric lights is probably the reason for much of the hard and contrasty home work we see displayed. It is well to supplement daylight by artificial, but I do not find in practice that it is necessary to carry an electric equipment. The new flash lamps seem to be successful, but cumbersome. A good open flash that spreads along a channel of metal and sets off by a trigger and cap is occasionally very useful. Employed with skill, its results are good. I have often helped out with a small flash, and no trace of its use can be found in the negative. Of course, it must always be fired so that no direct light from it can enter the lens. A lamp of this kind is very inexpensive, and can be carried in the pocket.

The figure should be made to play a more important part in home portraits, giving them real value as human documents, and it should usually be possible with the sitter "at home" to include something of their surroundings, something suggesting the subject to their intimate friends, who are the ultimate recipients of personal photographs.

There can be no doubt regarding the tremendous advantage this growing opportunity presents to the photographer who is alive to its great possibilities and able to surmount the difficulties. Always confronted with new conditions, new surroundings and new light effects, he should give full play to his originality, and produce work of infinite variety and charm, reflecting the changed conditions rather than seeking to knock every portrait and condition down to the dead level of studio mediocrity and sameness. He is no longer bound and trammelled by a skylight and its few changes of lighting effects—by a few pieces of furniture and accessories that must be used again and again, day after day, until, dispose them as he may, they appear and reappear in his work *ad nauseam*. He has at hand a great variety of accessories and furniture all waiting to be fitted into his portraits, which, if employed judiciously, and recorded with simple truth and beauty, will make his work instinct with life and character and give it those indefinable qualities which differentiate each person from every other, which may be summed up in the single expression of "personality."

I venture to advise that any disarrangement of furniture, curtains, or pictures be religiously restored just as found. The housewife and her servants will appreciate your care and thoughtfulness.

In proceeding to make negatives, the first thing that should be guarded against is a violent or contrasty lighting. The sitter should be placed at some distance from the window, certainly six or eight feet, sometimes more, depending on the area of the window. If the window receives the direct light of the sun it should be covered with white tissue paper. A few pieces of gummed paper should always be carried, as it is very useful to fasten the tissue together and suspend it in the window. A good trick is to pull down the window shade and attach the tissue to it. By the simple process of allowing the shade to go up to its full extent the tissue will be carried up smoothly and the window covered. If the light is very brilliant it is a wise plan to interpose an additional tissue paper screen between the window and the sitter. This may be fastened to a stick or a broom handle, and there is generally someone willing to hold it where wanted. A small clothes-horse from the kitchen will be found useful for this purpose. By this screen the light on the sitter can be toned, regulated and controlled. Letting a little light shoot in behind this screen will give a beautiful roundness. In case a Rembrandt or edge lighting is desired, the screen may be increased in opacity by a newspaper so that the light can be manipulated perfectly and the screen will still pass enough light to avoid hard shadows. It will be found that the tissued window diffuses the light very greatly and becomes the *source* of light.

Use a reflector, but do not overdo it. A sheet held by a member of the family or supported on a cord fastened across

the room is satisfactory. When no assistant is at hand, or no one can be impressed, I use a long cord (which I always carry), fastened to any convenient object at each end. The sheet may be suspended just where needed by the use of spring clothes-pins. The reflector is a real necessity nearly always, though many spots may be found, such as a corner with windows on each side admitting light of different degrees of strength. One window is sure to be brighter than the other, and if this condition is taken advantage of the subject gets a round lighting with soft shadows without a reflector. Here enters the faculty of observation and of adapting one's self to conditions.

In working in homes it is always best to select a room with light decorations, as the general illumination of the apartment is greatly enhanced by the reflections from light walls. It is frequently possible, under light decorative conditions, to avoid the use of a reflector. Sometimes a pier mirror is available as a reflector, and as this gives greater brilliancy, one must be on one's guard against unpleasant double lighting effects. A mirror reflects much more light than a white cloth, consequently it must be kept farther away from the sitter.

When a movable mirror is available many attractive variations on the simple portrait may be made by its use. Mirror pictures are justly popular with the ladies, and if the subject admits of a profile as well as a front or three-quarter-face pose, very picturesque and beautiful results may be produced. The mirror can be so placed that the reflected image is nearly in the same plane as the face proper, thus getting a sharp reflected image. Sometimes it is pleasing to let the reflection be only an accessory in the picture, in which case it is admissible for it to be out of focus to a certain extent. The head may be posed often without much regard to the reflection, producing an interesting and pleasing result. Often it may be necessary to reduce the lens aperture considerably in order to make both images reasonably sharp, and unless the light is abundant this involves a longer exposure, with danger of movement. I advise experiment with a mirror to find just the right angle to bring both images into focus at full opening. Short exposures, or the shortest possible, are always advantageous in order to record good expressions.

Care must be taken to avoid the inclusion of unpleasant objects in the mirror. This can be overcome, however, by having a plain cloth of almost any colour held where the mirror will reflect it with the sitter, but the tone of the background shown in the mirror should be a distinct contrast for the best effect. For mirrors on walls, oval shapes are the most desirable, because they are not noticeably altered in shape by the position of the camera. A very attractive effect may be produced by placing such a mirror about three feet from the window on the same wall. By manipulating a sheet diagonally in front of the window enough light is thrown upon the sitter to give a beautiful effect. In making this sort of a picture the other windows in the room can be used to give general illumination. The lens must be carefully screened to prevent any direct light reaching the plate and producing fog. Always bear in mind that the lens is also a window, and that it is easy to get more light than picture on the plate.

In conclusion, let me say that in the well-nigh universal gradgrind of our profession of photography there is too great a tendency to do things in the easiest way. It is, as before mentioned, much simpler to avoid figure poses and to blot out (scrape out) undesirable backgrounds and put in others by the use of the ground-glass substitute and stump work, creating something that is false, inappropriate, and absolutely inartistic, and the defence is that the customer likes it. It is infinitely better to find a suitable place for the portrait in the home and leave the natural result untouched, for by so doing not only is the portrait made appropriate, pleasing and artistic, but the result is achieved without additional labour and expense—surely a consummation devoutly to be wished. But—and here comes the rub!—this involves care, painstaking skill and resourcefulness on the part of the photographer. These desirable qualities should be more generally cultivated. I hope that this may be realised through the production of figure portraits in the home, for by just these virtues are better pictures to be made.

Furthermore, I believe in educating the client as well as ourselves. Let us in our studios emulate the example of a famous printing house said to do the best catalogue printing in America. In the anteroom through which visitors and customers must pass are exhibited in show cases many examples of early masterpieces of printing. This exhibit, says Henry Lewis Bullen, a great printing expert and authority, creates an *expectancy* of quality and lends dignity to the printing house. If we photographers would collect and display masterpieces of drawing, painting and sculpture, done by photography and in plaster, of faultless and recognised merit, would not they have a similar effect on our customers and visitors? It would at least tend to show that we had ideals, and in educating the customer we would likewise educate ourselves, making easier of accomplishment many things we now pass over as quite too much trouble to be considered. It has been well said that if we are to do beautiful things we must live in an atmosphere of beauty and refinement, so that our habit of thought tends that way. A beautiful environment has a potent influence on workers of every degree. The mind thus becomes educated, and better work is the unconscious result. Let us have ideals, and work toward them.

Home portraiture is an avenue of escape from the humdrum stereotypes of the studio. Let us therefore grasp these delightful opportunities and try to accomplish more original and beautiful results. Every sitting in the home is an adventure, fraught with wonderful possibilities. The way is an untrammelled one. Keep your minds open for new effects. See with your minds more than with your eyes, and your results will often surprise yourselves. These things are of vital interest to those among the profession who hope to see the photographic portrait business carried on prosperously and pleasurably by all who are engaged in honest endeavour. Wherever home portraiture fails to be honoured and sought after and well paid for, the cause is to be found in the limitations of the photographers themselves. Home portraiture is an art that requires intelligence and ability above the average to make it really successful. The mechanics and processes of the art are very efficient, and there is no secret as to methods; its failure is in those who use the machinery and methods. The route to eminence is through the study of inspiring works of art. There is no other way. Rudolf Eickemeyer achieved his great reputation and incidentally his great collection of medals and other honours by persistent application, study and hard work. Edison says that "genius is 10 per cent. inspiration and 90 per cent. perspiration"; in other words, the capacity for taking infinite pains.

CHARLES H. DAVIS.

THE ENSIGN QUARTERLY of Messrs. Houghtons, Ltd., which is just issued, in its address to dealers, strikes a confident note of the future of the British photographic apparatus trade, even while it asks for patience on the part of dealers and a recognition of the difficulties of the time. The little journal invites dealers to make the personal acquaintance of Mr. Stanley Houghton, now the firm's sales manager, and it gives some examples of the distinctive and attractive advertising which Messrs. Houghtons are using in the lay Press in accordance with their programme of popularising Ensign photography.

PRACTICUS IN THE STUDIO.

[Previous articles of this series, in which the aim of the writer is to communicate items of a long experience in studio portraiture, have appeared weekly since the beginning of the present year. It is not thought possible to continue the series to the length of that by the same writer which ran through the "British Journal" some years ago, but if any reader among the younger generation of photographers, and particularly those engaged as assistants, has a particular subject which might be dealt with, his or her suggestion will be welcomed. The subjects of the previous articles of the series have been as follows:—

A Talk About Lighting (Jan. 3).
The Camera and the Lens (Jan. 10).
Managing the Sitter (Jan. 17).
Backgrounds (Jan. 24).
Studio Exposures (Jan. 31).
Artificial Lighting (Feb. 7).
Printing Processes for Portraiture (Feb. 14).
Studio Accessories and Furniture (Feb. 21).
The Surroundings of the Studio (Feb. 28).
Studio Heating and Ventilation (March 7).
The Postcard Studio (March 14).
The Printing-Room (March 21).
About the Reception Room (March 28).
Home Portraiture (April 4).
Portable Studios (April 11).
Copying (April 18).
Handling the Studio Camera (April 25).
More About Lenses (May 2).
Enlargements (May 9).
Advertising the Studio (May 16).
Mounts and Mounting (May 23).
Business Methods (May 30).
Photographing Children (June 6).
Portraits of Elderly People (June 13).
Something about Lenses (June 20).
Hand Cameras for Professionals (June 27).
The Dark-Room and Its Fittings (July 4).
Plates and Their Work (July 11).
Apparstus Repairs and Renovations (July 18).
Posing the Head (July 25).
Intensifying Portrait Negatives (Aug. 1).

WORKSHOP JOBS.

The photographer whose lines are cash in a small town cannot afford to specialise in any one branch of work, but has to be prepared to undertake any commission which comes in his way. In London and most of the great centres there are specialists in photography as there are in medicine, engineering, architecture, and these keep pretty strictly to their own lines. The man who has attained a position as a delineator of society beauties does not seek a job to photograph the interior of a factory, while the technical man who is au fait in engineering and architectural work keeps equally aloof from making flattering portraits. The "country mouse" has, however, to be a good all round photographer, for he cannot afford to decline jobs which may make all the difference between a bare struggle for existence and comparative comfort. This being so, he must pay great attention to what I may call the minor technics of his work, for on these his success in branches other than portraiture must mainly depend. To be a successful portraitist, a man must have natural genius, but for technical work the genius that arises from "an infinite capacity for taking pains" is the kind required.

Factory and workshop photography, comprising interiors and exteriors of buildings, as well as single machines and other constructions, is a class of work which every general practitioner is called upon to do from time to time, and if the prints are to compare on equal terms with those made by specialists, a considerable amount of study as to the best apparatus and conditions required will be necessary. The photographer must also be able to point out to his clients in advance whether certain photographs can be attempted with any reasonable chance of success, but must not put difficulties in the way unnecessarily. I have always found customers of this class very reasonable to deal with, and ready to accept any suggestion which may lead to a successful issue, much heartburning being avoided by having a clear understanding before starting on exposures.

To give a clearer idea of what I mean, I will suppose that an engineer sends for me and says that he wants a series of views of his workshops taken. My first action would be to ask him to come round the building, and to point out what were the especial features of interest in each department, and the angle which it was desired to include. Also, I should at this stage arrange if possible for any touching up or preparation of such articles as would be improved by a little judicious "faking." This should, if possible, be arranged before the actual time fixed for the work, so that the photographer need not waste valuable time while these preliminaries are being attended to. The client will often be willing to remove benches or even small pieces of machinery if they would interfere with a good view of the shop as a whole. Windows may require blocking up, and sometimes the machinery itself may require a little treatment such as dulling bright parts, painting other parts a lighter colour, and general tidying up.

Extremely wide-angled views should be avoided if possible, as the unnatural-looking perspective which results is often very unsatisfactory. Wheels which should be circular appear elliptical, while cylinders assume shapes which no engineer would tolerate. If, however, such views have to be made, care must be taken so to choose the point of view that these effects are reduced to a minimum. It must always be remembered that artistic effects of light and shade are not appreciated in commercial work if they exist at the expense of detail, and, therefore, one must be careful to give full exposures so that no large expanses of unfilled shadow are left in the negative. An exposure meter is a great help to the inexperienced, and as the standard tint takes rather too much time in most workshop interiors, it is advisable to use a "studio" or "snapshot" dial by means of which a test can be made in a reasonable time. Many years ago a very experienced technical photographer, Mr. J. A. Harrison, who had himself been an engineer, devised a little camera on the photo-button model, using one inch squarss of the same brand of plates which were to be used for the large negatives. The lens had an aperture of $f/4$, and the exposures were developed in the camera. This was a perfect exposure meter, but somewhat cumbrous as compared with the modern instruments.

The lenses should be carefully selected, and anastigmats will be found preferable not only on account of their superior marginal definition, but because it is easier to arrange the view on the screen at, say, $f/8$ than it is at $f/16$, which is the maximum aperture of the older types of wide-angle lenses. The final focussing should be done with as small an aperture as convenient, and it is helpful to have a card or two printed in bold type which can be held in different places by an assistant, so as to be sure that everything is well in focus. A focussing eye-piece is generally desirable, and the focussing cloth should be ample in size, and quite opaque, so as to make the most of the feebly-lighted image. If it be found impossible to get sufficient depth, the definition at the farther end of

the room should be sacrificed rather than that in the foreground, as this gives a much better effect in the print. As a rule, a rather high standpoint should be chosen, the lens being six or seven feet from the floor. This gives a better general view, and prevents one machine or article from blocking out another. It also allows of a larger aperture being used, as it necessitates the camera being tilted down to include the foreground; then, as the top of the camera back has to be swung *outwards* to rectify the vertical lines, it helps to bring the foreground into focus, exactly the reverse effect of that obtained when pointing the lens upward, which necessitates the use of the smallest stops. The high position also minimises the necessity for raising the front—a rather important advantage when using a wide-angle lens to the limit of its capacity.

As the exposures are necessarily long, it is advisable to use rapid plates, as it makes a considerable difference in a day's work, whether ten minutes or half-an-hour is needed for each exposure. In well-lighted shops it is often possible to get exposures short enough to include the workmen at their benches or lathes, the exposures being then anything from 15 seconds to a minute. A flashlight fired at the end of such an exposure will often greatly improve a rather dark foreground without interfering with the general daylight effect. Plates should always be backed, and if there are any windows directly facing the camera they should, if possible, be covered up for part of the exposure. This can often be done from the outside by hoisting a sheet on a couple of poles.

It may be thought that the foregoing instructions seem to tend rather in the direction of fussiness, but nothing that will help to secure a good result should be overlooked. It is the man who walks in and takes the place "just as it is" who runs the risk of having his work turned down. Circumstances may be favourable, and the job may turn out well without much trouble, but it is in difficult work that a reputation can be made, especially if another photographer has previously failed.

As a rule, the prints should be made on glossy paper, as not only does it show detail better, but the surface keeps cleaner. Personally, I still prefer P.O.P. for such work, toning to a good purple black. It is also easier to shade and fake in printing, as the effect can be seen while printing is in progress. For reproduction glossy bromide is often required, and for some negatives is to be preferred, as softer prints can be obtained by giving full exposure and short development. This may give a bad colour to look at, but one which will reproduce well. Despite a general impression to the contrary, hard or brilliant prints are not required for process work. The engraver can modify the contrast to a considerable extent, but he cannot supply black patches with detail.

A point which is often overlooked is that, as the size of a direct negative is increased, the difficulty of securing adequate depth of focus is increased in a greater proportion. This is easily realised if we consider what is done every day with the little fixed focus cameras with apertures of about *f*/12. The photographer who works a 15 × 12 camera will find that he hardly gets equal depth at *f*/64. I had recently to make a series of 15 × 12 prints showing men at work, some of them fairly close to the camera, and others far away; *f*/64 was impossible; therefore, I used a half-plate camera fitted with a 4-in. lens, and secured sharp negatives at *f*/22. When enlarged to 15 × 12, the general sharpness was far better than that which could have been obtained in any other way.

PRACTICUS.

HOW TO INCREASE PRODUCTION AND REDUCE SELLING PRICES OF PHOTO-ENGRAVING.

(A paper read before the Convention of the American Photo-Engravers' Association, June 20, 1919.)

WE are all in business to make a profit, and it is a tacit assumption that we must maintain at least the same profit if we reduce the selling price; in fact, if the aggregate profit is not to be greater there is little object in either increasing production or reducing selling price, unless the photo-engraver wants to benefit his kind by providing abundance of engraving without hope of any extra reward for his efforts.

Highly profitable businesses can be divided into two kinds, the common object produced in huge volume and the extremely rare object which has a monopoly value because of its scarcity. The Ford motor-car is an example of the first. Because of its quantity production the profits are large, although the highest wages are paid and the best material is used. The profits on each machine are probably not proportionately so much as on the Rolls-Royce car, but in the aggregate they are enormous. The other type of profitable business is the antique dealer, who, if he has a suitable market, can sell his treasures at a profit of thousands per cent. Now there is no chance of photo-engravings coming into the latter category, so we are confined to seeing how nearly we can approach the volume production type.

As I stated in my paper on "Technical Requirements for Profitable Photo-engraving," read at the St. Louis Convention, the first necessity for profitable business is plenty, but not too much, work all the time. Every engraver knows that if he makes an average profit with an average volume of work, when he doubles the volume his profits will increase more than proportionately; if he halves his volume, not only will his profits vanish, but a serious loss be incurred. This volume must be evenly distributed: where too much work is almost as bad as not to have enough; everybody is worried to death, and work is often poor as a consequence.

Unless we have volume, therefore, there is no chance of reducing costs or reducing prices: if you have volume both would be practicable. How can the engraver get a bigger volume of work? By inducing further consumption. How much further can consumption be increased? and will the increased consumption be supplied by the firms already in the business? If not, that is if fresh firms are to be started, there will be no increased volume for those already in business, and therefore the cost of production will remain the same. It is useless to talk about technical improvements or organisation of staff unless you have a volume of work that will enable you to instal time-saving methods and the very increase of work with a staff that is willing to co-operate will itself cause quicker methods to be adopted. Economy in production is almost entirely a question of subdivision of labour and specialisation, and this can only be accomplished where there is a large volume of work and a staff of specialists to handle it in smaller and smaller stages.

It is unlikely that we shall see specialisation of the various fields of photo-engraving and each firm undertaking only the work for which they are exceptionally qualified. This might lead to a lowering of cost of production, but, as things are now, it is difficult to see that a very great lowering of cost can be expected. If we have to handle all kinds of work well, all we can do is to get men of the highest skill, and endeavour to see that they do their work in the most efficient way—not a very easy thing, for a highly-skilled man often insists upon doing his work in his own way, however wasteful, and if you want him to do it differently he is no longer skilful, but tends to spoil everything.

It is no doubt possible a certain amount of extra production could be obtained even by present methods if we had complete co-operation of staff and willingness to speed up, but this cannot be

expected unless the men have some further incentive than their regular weekly wage, and therefore some extra payment for extra product must be provided.

This is a difficult thing to work out for photo-engraving, but, nevertheless I believe it can be done, and, in fact, must be done if we want to reduce costs of production. The men would have to be guaranteed their regular wage in any event, and then all over a certain standard of production would be paid for extra, and they should be allowed, or invited to have, some voice in the fixing of these rates; that is, you must govern with the consent of the governed. Their payments should take the form of cash, paid as soon as possible after the work was completed, so that the incentive and the reward are not too far apart.

Careful track of costs must be kept if we are to know which kind of production pays and which does not pay, so that the latter may be eliminated. Overtime must not be worked without it being distinctly understood that there is an extra charge, to cover its cost. Duplicates should be encouraged. Cash payments must be required, as long credits and bad debts are part of the present cost of production.

As far as I can see, there is small prospect at present of costs of production being reduced, but I have stated what I think are the necessary conditions. If these conditions can be complied with, there is no reason why costs should not be lowered, and, if the engravers wish to do it, selling prices reduced; not otherwise.

A. J. N.

THE BRITISH PHOTOGRAPHIC RESEARCH ASSOCIATION.

The following are extracts from the recent report of the Director of Research, Dr. R. E. Slade :—

A wide programme of research has been drawn up and preliminary experiments made on a large number of the subjects mentioned in the programme.

The history of photographic science and industrial development shows that since the publication in 1891 of the researches of Hurter and Driffield, practically no new methods of attacking the problems of photography have been introduced. Many workers have improved and worked out further details of the old-established methods, and very considerable advances have been made, but the time now seems ripe for entirely new methods of photographic research. The Association is using all the means at its disposal to initiate such new methods, and is making progress in this direction.

As is laid down in our programme, we are attacking problems by investigating the fundamental principles by any or all of the latest scientific methods. We do not generally make use of what I may call empirical methods guided by scientific knowledge, because this is what is being done in the factories, and the factories are in a better position to do this than we are. It is, indeed, by these empirical methods that the photographic industry has obtained its present excellent position. We believe, however, that we are taking a long-sighted view, and that we shall open up new fields in which we shall use all the methods we can, including empirical methods, to get results of technical and industrial value.

We have made some experiments on gelatine, which, though not suitable for publication, will be of great use to us in future work. Progress has been made in our investigations of photographic emulsions, and we shall shortly have a communication on this subject to circulate to members concerned.

I might mention here that we have succeeded in staining wood black or grey right through. This black wood, which was made in Germany before the war, is used by manufacturers of cameras and optical instruments, and the grey wood is used for picture frames and furniture. Our process, for which an application for a patent has been filed, should be quite suitable for use on a large scale, and quite economical. This was a research carried out entirely by empirical methods guided by our knowledge of the methods used in dyeing cotton. As we are not immediately interested in the further development of dyeing wood, there is no reason for us to find out why the methods of dyeing cotton cannot be directly applied to wood. Perhaps some day the furniture manufacturers of this country will find it to their interest to investigate this problem.

We have already published two communications from the laboratory in scientific journals. They are :—

"Contrast and Exposure in X-ray Photographs through Metals," by Dr. R. E. Slade, D.Sc., F.I.C.

"The Fundamental Law for the True Photographic Rendering of Contrast," by A. W. Porter, D.Sc., F.R.S., and R. E. Slade, D.Sc.

Results of research, whether theoretical or experimental, which are of general interest and not of immediate use for application to specific problems of the industry, are published at the first opportunity, to increase knowledge in photographic science generally and to induce other workers to devote their attention to theoretical problems.

As an example of the advantage to be gained by publication, I may say that the first paper mentioned above caused a good deal of discussion in certain scientific circles, and as a direct result I combined with Professor A. W. Porter, F.R.S., in the production of the second paper, which clears up an important point in the fundamental theory of the photographic process, a point which Hurter and Driffield attempted, but failed, to elucidate.

H.M. THE BABY.

The photographer, possibly more than any other business man, has reason to know that fond parents are never tired of seeing representations of their offspring. The amateur knows also, and suffers acutely from the voracious appetite for "snaps" of baby. The power of H.M. the baby to loose the purse strings is truly remarkable. But in this article we are not concerned so much with methods of exploiting the dear infant once it is in the studio as with a method for getting the little cherub there.

First Catch.

In this connection it may be remarked that, like the hare in the cookery book, baby must first be caught. Naturally baby must be caught young, the younger the better for our purpose, as will be seen. How to do it—that is the question. The plan sketched out below may be new to many readers, but its potentialities from the point of view of business are great.

A Systematic Record.

Some most valuable information is presented free every day to the photographer who cares to look for it. It is fortunate for him that despite the age-long repetition of the occurrence there are still many thousands of parents who like to announce the circumstance of the advent of another "little stranger" by putting a notice in the Press. Any enterprising photographer who cares to make and conscientiously keep records of these announcements should be able to derive profit therefrom. The idea, in a nutshell, is to note the name and address, and in due course—when there is something a little more tangible than frills and bubbles to see—invite the proud parent to have the baby photographed. Somebody will have to photograph that baby—the thing is to see that at any rate you make a good bid for the business.

Looking Ahead.

But the idea runs further than baby's first photograph, and the value of such a record will increase as time goes on. Suppose, for example, the reader has made the first photograph, during the course of which business he has, like a wise man, found out the child's Christian name, and so on. The record is amplified, and on the occasion of the first birthday a suggestion can be sent along that baby be photographed on the first birthday, and after the first on every birthday as it comes along, and while the sitter remains in the district. At first the interest of the parents should be strong enough to keep the habit alive. Later the young person's interest in him or herself should help the photographer to establish the desire to preserve a record of looks at each birthday. Alfred Russell Wallace deplored the fact that people did not have themselves regularly photographed on their birthdays or at other stated times from infancy to age, as such a record, he said, would be of great value, besides providing interesting evidence of the moulding of feature and expression under the hand of time.

How to Do It.

The reader who is unacquainted with modern devices for simplifying business may see visions of much work in the keeping of the records suggested. But it is really quite a simple matter. The thing may be done in a variety of ways, and each may do it as he chooses. But those who wish for advice may be recommended to try a simple card index. The size of the card may be 5 by 3, which is a standard size, and a single-drawer cabinet may be made or bought that will hold 1,000 cards. First make twelve sets, each numbered 1 to 31 in the right-hand corners; these we may call daily cards. Then make twelve guide cards—*i.e.*, cards with tabs projecting above the ordinary cards—and write the names of the months on these. Now put one set of numbered cards behind each month card. The records can be made either on the numbered cards, or a separate card for each entry may be kept behind the numbered cards; and in addition to name and address, record made of invitations sent and business resulting. The record will, of course, consist of name and address of parents (to be supplemented later by child's Christian name), and date of birth. Each separate card should have the month and date inscribed on the top right-hand corner. Here is a convenient way of doing it:—7819 means August 7, 1919. If that card is removed from the index, then it is easily replaced in its proper position by reference to the number on it.

Using the Records.

It will be seen that the records may be used at once, and also year by year as the dates come round. The first attack would naturally be made within a few weeks of the record being made. Thereafter the thing would be worked by a scrutiny a week or two ahead of the dates, so that the invitation should reach the prospective sitter just as the birthday looms on the near horizon.

Avoiding Blunders.

Care must, of course, be taken to prevent an invitation being sent that might reopen a wound caused by the death of the child. Births and deaths announcements must therefore be studied together, and a second index or record in a book, in alphabetical sequence of names, is necessary to enable the record to be struck out or removed in case of death or removal of the family. To make assurance doubly sure, judicious enquiry of the milkman, the baker, or other daily visitor to the house is recommended before the invitation is actually despatched. Or it may be sent by hand by an intelligent bearer, who will enquire before actually leaving the note. Reasonable care will prevent any unfortunate incidents of this sort.

M.

Assistants' Notes.

Notes by assistants suitable for this column will be considered and paid for on the first of the month following publication.

Replacing a Focussing Screen.

I suppose that most of us have at one time or another had the mortifying experience of smashing a focussing screen. At the best, this is most annoying; but when it happens far from the studio, with an urgent job to be done, it becomes a positive disaster. However, things are rarely so bad as they seem, and a little ingenuity will usually find a way of repairing the damage. So, perhaps, a brief review of the means at our disposal for replacing a breakage may prove of interest. We will divide the subject into three sections:—

A. The provision of a permanent screen.

B. The provision of a temporary glass screen.

C The provision of a substitute when glass is not available.

To take section A first. The provision of a permanent screen may be necessary either to replace a breakage, or to improve on an existing screen, and certainly many screens in regular use are open to great improvement in the matters of fineness of grain and translucency. Unless one has compared two screens under similar conditions, it is almost impossible to realise the added ease in working given by a really fine screen.

A very satisfactory screen may be prepared by grinding two glasses together with knife powder. The powder must be slightly damp, and it will then be found to grind very slowly, but with a beautifully fine grain. Emery powder is often recommended for this process, but there is the danger of getting a coarse grade, and, although it is certainly quicker to "bite" the glass, I do not think that the result is so good. Personally, I have found nothing so good as "Wellington" knife polish. Incidentally, it should be mentioned that it is no good trying to "rush" the grinding process, as the usual result is a smashed glass.

Glass may be given a very fine matt surface by etching it with an acid, but it is hardly the job for anyone but an expert to undertake. This is the method by which most of the finest commercial screens are prepared.

When an exceptionally fine screen is required, it is best to give up the idea of matting the glass itself; the best way is to use a fine-grain dry plate (unexposed, of course), and give it a slight "red fog." This may be done by developing it, in the dark room, of course, in a ferrous citrate developer to which ammonia has been added in sufficient quantity to make it slightly alkaline. This gives a beautiful screen, which is unbeatable for any delicate work. As ferrous citrate has gone out of use, and the average man has not time to make up new solutions, it may be as well to give another way of getting a somewhat similar result. Slightly light-fog a plate; for instance, expose a slow plate for five seconds at 20 ft. from a burning match, and then develop fully in any non-staining developer. To get the best results by this process it is essential that development should be full, so the exposure must be adjusted to give the correct density. If a large screen is wanted it will be found best to use a smaller plate of the same brand to experiment on, as, at first, it is difficult to judge the required exposure.

A very fine, but somewhat delicate surface for focussing may be got by flowing on to glass a mixture of: white wax (½ oz.) in ether (1 oz.) in the proportions indicated. This dries quickly, and gives quite a good surface; but, unless protected by a varnish, it is very liable to mechanical injury.

We will now pass on to section B. Temporary screens may be prepared in dozens of ways, but one of the best is by applying ordinary matt varnish to glass, or, if matt varnish is not at hand, ordinary negative varnish may be used. It should be mixed with about an equal quantity of water, in order to get a matt effect.

These give quite satisfactory screens, but often varnish is not at hand; anything that will leave a thin film on the surface of glass may be used. For instance, flour paste, and photographic mountant may be smeared over the glass, or putty or Plasticine may be daubed on to it. The trouble with these make-shifts is to get a fine grain; but, with care, a decent surface may be prepared.

Quite a good screen can be made by soaking a sheet of tracing-paper in glycerine, or even, at a pinch, in water, and squeegeing it on to glass. This is rather a messy process, and it must, of course, be used before the paper becomes dry; but while it is wet it is remarkably efficient.

In cases of great urgency, an unexposed dry plate may be used as a screen without any preparation, but even the thinnest emulsion stops so much light that focussing is very difficult. Still, it is often a quick way out of an awkward position. Also I have focussed on a negative fitted into the screen frame, but this is a last resort, and is not to be recommended.

Now, our last section. When a screen must be made and no glass is at hand, it is a bad case, and it is impossible to make a really satisfactory substitute. But there is no need to give up in despair. Any translucent substance may be used; paper is often useful, the more transparent, but, at the same time, the more stiff the paper is, the better; or any fabric—a white handkerchief, for example, may be used. But whenever such a material is used, don't try and fit it in where the glass would fit, it is bound to wrinkle if you do. Either pin or stick it over the back of the frame, and make the necessary allowance for the difference in position after focussing is finished. The best way to fix either paper or fabric to the screen frame is to damp it slightly, and stick it round the edges with Seccotine. It will then dry up tightly stretched.

But, after all, prevention is so obviously better than cure in the case of a broken screen, that a few hints may be useful. Never let your screen become loose in the frame; small wedges of cork or rubber will fix it securely. If anything goes wrong with the catches on the reversing back, it should be seen to at once. Always protect

your screen with a sheet of stout card when the camera is in its case, and when space permits, wrap your camera in the focussing cloth. A solid leather case is an expensive item in these days, but the added protection to the apparatus makes it a good investment.—A. G. Willis.

Photo-Mechanical Notes.

Printing on Wood for Engraving.

To those who are interested in the above process, the following formulæ may prove of service for obtaining photographs direct from the negative on to wood. It must be borne in mind that the negative must be made through a prism or with a mirror in order that when it is printed the image is laterally reversed.

In using the following formulæ it is advisable to brush the sides of the wood block with melted paraffin wax or with celluloid varnish, otherwise there is a danger of the wood warping through contact with water.

Formula I.

Make a 5 per cent. silver nitrate solution, also a saturated solution of potassium oxalate. Add the oxalate solution to the nitrate solution until precipitation is complete. Filter to obtain precipitate, which can be used at once or allowed to dry, taking care not to expose it to strong light. Next mix together equal quantities of a 5 per cent. gelatine solution, and a 10 per cent. solution of dextrine, and take a small quantity of this mixture together with a few grains of flake white and sufficient of the above precipitate to form a paste when rubbed on the wood with the finger. The paste should not be too thin. Finally brush the paste over the wood with a flat camel-hair brush to obtain an even coating, and allow it to dry in the dark. The amount of exposure required depends upon the negative and source of light. Using an enclosed arc lamp (6 amps. 200 volt) the exposure for a negative of average density at a distance of 15 inches from the light would be about 5 mins. After exposure, without preliminary washing, fix in a 10 per cent. solution of ammonia (.880), by holding face down for one minute, wash for one minute under a gentle stream of water, and put by to dry. It is advisable to keep the finished print from strong light until it is ready to work upon.

Formula II.

Prepare the following solutions :—

A.—Silver nitrate	15 grs.	1 gram.
Citric acid	15 grs.	1 gram.
Water (distilled)	240 minims	15 c.c.s.
B.—Sodium chloride	3 grs.	0·2 gram.
Potassium bromido	6 grs.	0·4 gram.
Citric acid	15 grs.	1 gram.
Gelatine	10 grs.	0·7 gram.
Water (distilled)	240 minims	15 c.c.s.

Mix the above solutions, filter and rub a sufficient quantity of the precipitate to form a smooth paste on the wood surface, brushing with a flat brush to obtain an even coating, afterwards allowing to dry in the dark. Should the precipitate be dry it may be worked into a paste by adding a few drops of a 5 per cent. solution of gelatine. The exposure with this formula is approximately the same as with Formula I. Fix in a 10 per cent. solution of ammonia (.880), holding face down for one minute, wash under a gentle stream of water, and allow to dry, when it is ready for the engraver.

Formula III.

In this formula use is made of the "blue printing" process with slight modifications. Make up the following solutions separately, then mix them and keep in a dark place.

A.—Ferric ammonia citrate (green crystals)	2 o s.	60 grams
Water	9 ozs.	250 c.c.s.
B.—Potassium ferricyanide	1½ ozs.	45 grams
Water	9 ozs.	250 c.c.s.

Pour a small quantity of gelatine and dextrine mixture, prepared as in Formula I., on the wood and add sufficient flake white to form a thin white paste. Coat the surface evenly by means of a flat brush, and when thoroughly dry flow over two or three times with the combined A and B solution. Expose until a faint image is visible. With an enclosed arc lamp (6 amps. 200 volt) this will take about three minutes at 18 inches from the light for a negative of average density. Develop by dipping the block face down in a dish of clean cold water. The image may be brightened by immersing in a 1 per cent. solution of nitric acid. After allowing to dry naturally it is ready for use.

With each of the above formulæ it will be found that a contrasty negative will give the best result.

Use may also be made of the "Kodak Transferotype" paper, operations being carried out as indicated in the instructions found in the packet. In this case it should be remembered that the negative must be unreversed, i.e., not made through a prism or with a mirror. The chief objection to this process is that the gelatine is apt to split or chip when the engraver works upon it.—E. L. Turner.

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Applications, July 21 to 26.

Lenses.—No. 18,463. Objectives for photographic, etc., purposes. L. B. Booth.

Exposure Meters.—No. 18,447 Exposure meters. M. L. Godefroy.

Projection Screens.—No. 18,201.—Cinematograph screens. G. F. Priestly.

Colour Photography.—No. 18,601. Ruled screen bases for one-plate heliochromy. J. T. Smith

Colour Photography.—No. 18,585. Production of coloured diapositives. S. P. Gorsky.

Photography.—No. 18,223 Photography. Move-O-Graphs, Ltd.

Cinematography.—No. 18,595. Cinematography. B. T. Lang.

Cinematography.—No. 18,451. Cinematograph apparatus. L. Fiorillo.

Cinematography.—No. 18,135. Motion picture apparatus. S. F. Stein.

COMPLETE SPECIFICATIONS ACCEPTED,

These specifications are obtainable, price 6d. each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

High Temperature Development.—No. 128,337 (April 20, 1918).—According to the invention, a hardening bath is provided for treating gelatine-surfaced photographic materials prior to subjecting them to the action of a developer, which bath contains formaline, paraformaldehyde, or a compound from which formaldehyde is readily generated, together with a salt (for example, sodium citrate or sodium sulphate or di-sodium ortho-phosphate) of the class which tends to raise the melting point of a gelatine jelly and to retard or restrict the swelling of dry gelatine in water.

The invention further consists in the process for developing gelatine-surfaced photographic materials at high temperatures consisting in first subjecting the material to a hardening bath such as above described, and then subjecting it to a developer. It is found that if a photographic plate, for example, be first hardened in the above manner, it can afterwards be developed or toned with ease by any of the known developers or toning baths at a high temperature.

The class of salts referred to includes acetates, tartrates, citrates, oxalates, sulphates, phosphates, chromates, bicarbonates and borates.

A formula for this preliminary bath may be as follows :—

40 per cent. formaline	¼ oz.
Sodium sulphate, crystals	2 oz.
or Di-sodium ortho-phosphate	1 oz.
Water, up to	10 oz.

or if paraformaldehyde be employed 50 grains of this may be used instead of the ¼ oz. of formaline.

The above formula may be compounded and kept indefinitely, or

the paraformaldehyde and sodium sulphate or other salt in anhydrous form may be made up as powders or into pellets and sold in this condition for dissolving when required in the necessary quantity of water.

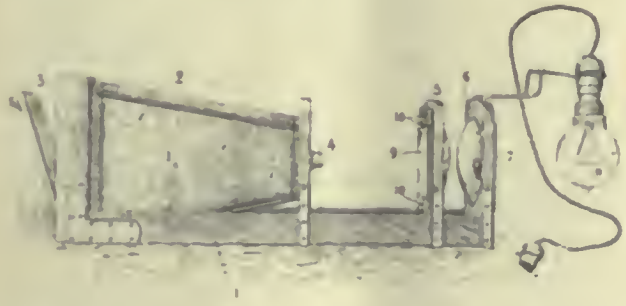
It has been found that by using this preliminary bath, photographic plates and other materials can be manipulated, that is developed, toned, fixed, washed or otherwise treated with aqueous solutions, at a temperature as high as 110 deg. F. without any cooling means being necessary. The salt retards the swelling and prevents melting of the gelatine while the formaline is penetrating and combining with it to form an insoluble film, so that even though the bath may be at as high a temperature as 110 deg. F. the gelatine has no opportunity to melt before it is hardened by the formaline.

The advantage of using the above ingredients as a preliminary bath to a developing bath is great as it disposes of the need of using a special developer. Further, the fact that no development is taking place during this hardening, enables the developing to be carried out afterwards without undue haste, whereas when the hardening material has been incorporated in the developer, the hardening action has scarcely begun before development is finished and this is so rapid that, as already stated, it cannot be controlled; moreover the hardening effect being imperfect, subsequent treatment, such as fixing and washing of the plate, is exceedingly difficult and at such temperatures as 100 deg. to 110 deg. F. it is impossible even to complete development itself before the gelatine melts. When, however, the hardening is effected in a preliminary bath as described, the developing and fixing and washing can all be subsequently carried out in practically the same manner and with almost as much ease as would be the case if operating in ordinary temperatures.

In practice it is usual to proceed with development immediately after rinsing off the excess of the preliminary hardening bath.—Alexander Johnston Agnew, Frank Forster Renwick, both of Messrs. Ilford Limited, Ilford, Essex, and Ilford Limited, Ilford, Essex.

Enlarging Apparatus. No. 117,622 (July 4, 1917).—The base of the apparatus carries a hollow cone 2 which is light-tight and is closed at its rear by a dark slide 3 which carries the sensitive paper.

The end of the cone 2 may be of any usual construction to carry



a dark slide or a sheet of frosted glass, upon which the operator can see if the image is in the correct position.

4 is the lens of the apparatus. The two brackets 5 and 6 are completely separate from the cone 2 and are only connected by the base 1, and are each provided with a plano-convex lens so arranged as to form a condenser.

In front of the lens carried by the bracket 6 and also carried by this bracket is placed a plate of frosted glass 7 to diffuse the light from the lamp 8 which may be electric, incandescent gas, or acetylene.

The negative is placed on the plane face of the lens carried by the bracket 5 and is held in position by the plate of glass 9 supported by the springs which can be displaced sideways.

The presence of the diffusing glass 7 in front of the condenser is such that not only is the image reproduced well, but the distance between the light and the condenser need not be absolutely correct.—Pierre Boucard, Rue La Boëtie, Paris, and Louis Lemaire, Rue de Haras, La Garenne-Colombes, Paris.

Trade Names and Marks.

APPLICATIONS FOR REGISTRATION.

Grindellmatograph.—No. 391,535. Cinematograph apparatus, films for exhibition, talking machines, talking machine records, talking machine accessories and the like goods. Harry Grindell Matthews, New Passage Hotel, Pilning, near Bristol, electrical engineer. May 23, 1919.

REGISTRATIONS RENEWED.

Circoid.—No. 274,053. Registered by Houghtons, Limited, in 1905. (Class 1.)

Analecta.

Extracts from our weekly and monthly contemporaries.

Spirit Sensitisers in Oil Printing.

Some of the difficulties which the beginner in oil printing may experience must be put down (says M. J. McLaurin in the "Amateur Photographer" for August 6) to the use of methylated spirit in the sensitising bath. Commercial methylated spirit, I need hardly point out, is not a definite chemical compound; it is alcohol, to which impurities have been deliberately added to prevent its consumption as a beverage. Because what one worker buys as methylated spirit is suitable for the process, it by no means follows that what another gets is similarly suitable; and I have traced a whole series of failures to this cause.

There is no need to use the spirit sensitiser, although it must be admitted that it is a convenience, and, therefore, my advice would be that should the paper appear not to work well with the spirit, that this should be omitted altogether. If a night can be allowed to intervene between sensitising and printing, one of the baths in which the paper is immersed can be employed, but if instead of this a plain 5 per cent. solution of ammonium bichromate is used, applying it with a piece of flannel folded over a strip of glass, in exactly the same way as the spirit sensitiser is applied, it will be found that the paper will dry in an hour or two if it is hung up in a fairly roomy cupboard or in a darkened room.

My own impression is that such paper takes the pigment more "kindly" than when the spirit sensitiser is used, which is, on the face of it, likely, since most commercial methylated spirit is not completely volatile, but as it evaporates leaves some slight trace of greasiness behind it.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Saturday, August 9.

Hoddersfield Naturalist and Photographic Society. Excursion to Cannon Hall and Cawthorne.

Tuesday, August 12.

Hackney Photographic Society. "Development." W. Sells.

Thursday, August 14.

Bolley and District Photographic Society. Monthly Competition: "Roses."
Hampshire House Photographic Society. "Lantern Slides." H. Warner.

CROYDON CAMERA CLUB.

Mr. H. Guy Johnson last week lectured on "Telephone Transmitters," sensitive instruments, and the recipients of more lurid language than anything under the sun. At first sight the subject selected might indeed seem to be depressing, for all know the feeling of despair in advance when the request for a number traverses the wires, and is calmly deliberated upon at the other end, regardless of the fact that the subscriber may be experiencing a gamut of human emotions other than the benign. Yet in Mr. Johnson's hands the subject was invested with real interest as he traced the history of transmitters from the earliest types. Enticed by the dry-humorist, Mr. F. C. Reynolds, he finally drew on the blackboard the connections and varied instruments for a complete transmitting wireless set, and as complexity grew on

complexity, so hilarity increased in proportion. Richly educative are these informal meetings.

The previous week the aforesaid humorist gave an admirable demonstration on "How to run the club lantern," with valuable hints on the deportment and duties of the lanternist, which frequently include a fine sprint after the departed lecturer, owing to the last slide being left in the carrier.

He also described lantern optics in a way all could understand, for the lecturer always acts on the exceedingly wise assumption that not a few of his audience have no knowledge whatever of the subject under consideration. With equal wisdom he made no attempt to expand unduly on the purely optical side, which abounds in traps for the intrepid.

A novel way of making effective digram slides was also shown by him. The lines are ruled and lettering, etc., made on lantern-size fine ground-glass with a 6 H pencil (not too finely pointed), and the ground-glass is then cemented with Canada balsam to a plain cover-glass, rendering the slide "all clear," bar, of course, the drawing. A quiet evening with the docile Canada balsam freely on tap should secure many diagram slides, together with other mementoes of the occasion.

A discussion of some elegance followed the demonstration, Mr. H. P. C. Harpur appropriately leading off. He spoke favourably of slides developed with pyro-ammonia, which, he said, notably improved in tone by prolonged baking in the lantern, provided they were not allowed to attain red-heat, which would be prejudicial. No explanation was offered, but doubtless the volatilisation of the ammonia accounts for the phenomenon; with the so-called "fixed alkalis" the case would be different. (The return of the hot weather seems to have affected our contributor.—Ed. "B.J.")

Commercial & Legal Intelligence.

Legal Notices.—The partnership between Charles Rowe Major, Charles Howard Major, and Cyril Lawson Major, carrying on business as photographers at 152, Union Street, Plymouth, and Courtenay Street, Newton Abbot, both in Devon, under the style of C. R. Major and Sons, has been dissolved by mutual consent as from May 17 last. All debts due to and owing by the late firm will be received and paid by C. R. Major and C. L. Major, under the style of C. R. Major and Son.

A first and final dividend of 20s. in the £, and 4 per cent. interest, has been declared in the estate of William Curtis, photographic postcard maker and publisher, Kilnsey, near Skipton, Yorkshire. This dividend is obtainable at the Official Receiver's Office, 12, Duke Street, Bradford.

NEW COMPANIES.

Portraiture, Ltd.—This private company was registered on July 24, with a capital of £10,000, in £1 shares (5,000 15 per cent. cumulative preference). Objects: To carry on the business of photographers, portrait and miniature painters, frame makers, etc. An agreement with Elwin Neame, Ltd., is contemplated. The subscribers (each with one share) are:—S. Elwin Neame, 11, Rotherwick Road, Golders Green, N.W.4, photographer; W. A. E. Neame, Allestree, The Drive, Sidcup, Kent, bank accountant. The first directors are S. Elwin Neame and Wilfred Yonge, 7, Chatsworth Road, West Norwood, S.E. S. Elwin Neame is manager for life. Registered office: Onslow Place, South Kensington, S.W.

FORTHCOMING EXHIBITIONS.

September 13 to October 11.—London Salon of Photography. Entries close September 2. Hon. sec., 5a, Pall Mall East, London, S.W.1.

Major F. C. V. Laws, executive head of the Photographic Section of the R.A.F., appears in the list of those who have received permanent commissions in the Royal Air Force. In the case of many officers who are now taking a permanent commission, a lowering of rank by one step is not an infrequent feature of the present readjustment from a war to a peace basis. Since, however, Major Laws retains his full rank, it may be conjectured that he will remain at the head of the Photographic Section, with which he has been intimately associated since the outbreak of war.

Correspondence.

**** Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

**** We do not undertake responsibility for the opinions expressed by our correspondents.*

DISHES FOR HYPO-ALUM TONING.

To the Editors.

Gentlemen,—Regarding your note at the foot of letter from the Research Laboratory, Eastman Kodak Co. We have made quite a large number of hypo-alum toning baths for Messrs. Illingworth and Co., and have also supplied them to other houses, and find they have always given satisfaction. These baths are made in sheet steel enamelled. We should also like to point out that it is not possible to make dishes in pure tin, as pure tin is not obtainable in the sheet.—Yours faithfully, David Allan.

Whitfield Works, 107, Mansfield Street, p.p. J. Hazell.
Kingsland Road, London, E.2, August 2, 1919.

CO-OPERATIVE HOLIDAY CLOSING OF STUDIOS.

To the Editors.

Gentlemen,—May I be permitted, on behalf of the Council (now in recess), to congratulate Northampton photographers, and Mr. Greenway in particular, on the success they are achieving in this matter of combined closing for holiday purposes.

The Council would very much like to see all photographers come together for "district" purposes, which, as a rule, can be arranged much better locally than from an outside centre.

Mr. Greenway adds: "Are the P.P.A. Council alive to their responsibilities of sagacious leadership?" I can only say, in reply, that if he will offer any suggestions, I shall be only too glad of the opportunity to bring them before the Council, and keep him informed as to the results. I am sure I am correct in saying that the Council wants and welcomes all the help and support from its members that it is possible to secure.—Sincerely yours,

S. H. Fry, Hon. Sec.

5, Highbury Grove, London, N.5, August 2, 1919.

AN ASSISTANTS' PROFESSIONAL PHOTOGRAPHIC ASSOCIATION.

To the Editors.

Gentlemen,—"Experience," in his letter this week, raises a point I had not in mind when I wrote suggesting local effort in forming a photographic assistants' association. I also fail to see how such an association would benefit by the patronage of the Master Photographers' Association. It must stand by its own efforts. These efforts up to now have been very feeble, and my letter has brought me two in return. If there are only three of us in Lancashire interested, and each in a different town, I am afraid "Experience" will wait a long time for his fencing tournament.

Personally, I do not see anything particularly arrogant in the title of the Master Photographers' Association, and I fail to see why any society should not be at liberty to choose its own title. The particular member of this association who employs "Experience" must have some good points which counteract his arrogance, or he would not be able to keep any assistant of spirit for a period of eight years.—Yours faithfully, Wm. Aspden.

165, Church Road, Smithells, Bolton, August 1, 1919.

HOW'S THIS FOR PROFITEERING?

To the Editors.

Gentlemen,—I have just given up professional photography, and in clearing up generally I found I had a number of boards quite good and serviceable that had been sent to me by various enlarging houses that had at different times done work for me, fourteen in all to be exact, and for which I had been charged anything from 2s. per board upwards. I sent these to a firm which works for the trade, and this is the reply:—"By allowance 1s. 6d. I am allowing this in order to fully cover cost of carriage. The wood, however, is of little use to me, the only board that was

mine being too badly broken to use." Now, as I had written to this gentleman asking him if these boards were of use, and as I had his reply he would credit value, I sent same on carriage paid. The fourteen boards could be used in the business, and would, I daresay, be charged at this gentleman's usual rates, namely, 2s. per board or more, and he would thus be getting 28s. for what he was paying 1s. 6d. for. I wrote per return asking the good man to return the boards carriage forward, as I did not like taking so much money at one time.—Yours faithfully,

THANKFUL-OUT-OF-IT.

July 30, 1919.

FLATTENING POSTCARDS.

To the Editors.

Gentlemen,—I read with interest the article in the "B.J." of July 25 by Mr. M. C. Milburn on the flattening of postcards and his method for the prevention of curling. He remarks that placing cards under pressure is uncertain and unsatisfactory, and that he has seen a batch of cards so firmly stuck together that they were as solid as a block of wood. Such a result, it seems to me, can only be possible from lack of just enough common sense to know when the cards are sufficiently dry not to stick together.

Pressure has been the method I have always used, and of the many thousands so treated I do not remember a single case of trouble.

In the earlier days I simply used heavy weights, and although this answered the purpose quite well, it occurred to me that something

more convenient would be more useful. I enclose photograph of a press I made years ago, and which has given perfect satisfaction. I think the picture shows what a simple affair it is, and should, without any explanation, enable anyone to make a similar machine should he so wish. It may help if I mention the component parts.

The weight.—A box filled with old negatives (mine weighs about 30 lbs.).

Runners for Weight.—A couple of stair rods, cut to size as required.

Lever.—Mine is a hammer handle let in a square piece of wood, but, of course, can be made in any other way.

Posts and Cross Bar.—About 1½-in. quartering.

Spring.—One off an old printing frame bent suitably to work against a piece of wood cut with a notch to hold the weight while placing cards below. This is screwed to one of the posts, and must work freely.

Board or Platform.—1 in. in thickness, about 8 ins. in width, length according to size of machine.

Keep a couple of dozen old negatives on the platform below the weight. Place cards in dozens between plates, let them remain three or four hours under weight, and results will be perfect. Anyway, that has been my experience.

By Mr. Milburn's method one has to manipulate each card singly, whereas with the above you can deal in dozens, and leave them to take care of themselves.—Yours truly,

J. STANLEY.

Dulwich House Studio, Hamlet Court Road, Westcliffe-on-Sea.

Answers to Correspondents.

SPECIAL NOTICE.

In consequence of general reduced supplies of paper, as the result of prohibition of the importation of much wood pulp and grass, a smaller space will be available until further notice for replies to correspondents.

Moreover, we will answer by post if stamped and addressed envelope is enclosed for reply: 5-cent. International Coupon, from readers abroad.

The full questions and answers will be printed only in the case of inquiries of general interest.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

C. M.—With the additional glass you will be able to work well on both sides, but you did not show this on your plan. Sage green is a very good colour for the walls, but it should not be too light.

C. C.—We do not know the name "Besus" as applying to lenses. From the brief particulars you give it is impossible to say what the value is. Apparently it is a fairly modern wide-angle, but not at all a suitable lens for portraiture.

C. W.—There is no necessity to include the makers' or publishers' name on the view postcards. Most photographers who publish such cards prefer to put their name on them as an advertisement. No permission is required for taking photographs of streets in ordinary circumstances. It is, of course, diffeent in the case of processions and public functions, where, in most large towns, police permission is required for photography.

J. W.—There is no method of removing the reflections from the negatives. Evidently yours was a difficult subject, and we suppose it was impossible to get a good lighting of the shop while buildings on the opposite side of the road were not equally strongly lighted. Under such conditions about the best alternative is to arrange for the shop front to be photographed by night by flashlight, which, unless it is a very narrow thoroughfare, will leave the buildings on the other side unilluminated.

E. D. M.—The formula commonly attributed to the green ferric ammonium citrate is that first given by Valenta in a paper in "Photographische Korrespondenz," 1897, p. 77. We are sorry we cannot give you references to a translation of this paper, which apparently was not reprinted in the "B.J." at the time. Probably the nearest place where you can see a file of "Photographische Korrespondenz" is in the photographic and printing faculty of the Manchester College of Technology.

A. E.—As you do not give the aspect of your studio it is difficult to say what blinds you require. Your best plan would be to fit a set of festoon blinds as recommended in "The Portrait Studio," which our publishers will send you for 10d., post free. These blinds, if made of casement cloth, would not cost much, and you would have full control of the light. The print sent shows very fair lighting, but it was taken so late in that day that it proves nothing, the light by that time being naturally subdued.

W. N.—The tin protochloride is used more as a preparation for making the silver take to the glass than as a cleaning agent. As an alternative cleaner there is nothing better than strong nitric acid mixed with about equal bulk of water, but you can obtain the

stannous chloride quite easily from any dealers in chemicals, such as Messrs. Johnson and Sons, 23, Cross Street, Finsbury, London, E.C. It is a slow business making it by dissolving pure tin in hydrochloric acid. One requires to keep the strongly fuming acid at a boiling temperature for two or three hours.

W. B.—There is no reliable method of getting heliotrope or violet tones on any paper, but about the best process is to print on matt collodion P.O.P., to print deeply, and to tone in the following bath:—

Hydrochloric acid	6 ozs.
Gold chloride	10 grs.
Water to make	20 ozs.,

afterwards fixing in 5 per cent. hypo. A larger proportion of acid gives prints tending still more to violet.

S. W.—Four 1,000 c.p. lamps should answer your requirements. These should each be fitted with a white reflector and thin calico diffuser. We should fit them on the side nearest the high wall, in a curve, the first being nearly opposite the centre of the background eight feet away and about eight feet from the floor, the next a foot nearer the background and seven feet from the floor, the other two will serve as a side light and may be still lower. You will, of course, require a reflector on the shadow side of the sitter. A small, round head screen covered with cheese cloth is very useful for local control of the lighting.

D. C. S.—1. If you are working with a box printer there is no difficulty in having an attachment made so that the negative (and the thin paper mask laid upon it) are held down beneath a frame of just the size to take the postcard, the pressure back of the printer being fitted with a special piece to press the postcard within the frame. You could easily make a fitment of this kind yourself or get it from one of the makers of printing boxes, such as Houghtons or Marions 2. None of the chemicals mentioned in the formulæ require storing in non-actinic bottles (we suppose you mean non-actinic, although you say actinic), nor are the solutions any better for being kept in orange or dark brown bottles.

P. J.—For good lighting and rapid exposures a flash cabinet of the kind described in the "B.J." of December 6 last is immensely superior to any gas installation, but the question for you is whether you can instal a proper shaft and ventilation for carrying off the magnesium smoke. If you can, our advice is greatly in favour of the flash cabinet, although photographers in this country make very little use of it, whereas in America and France you find it used by a large number of photographers. One consideration against the gas installation is the comparatively small size and low height of your room. If the gas is going continuously for any length of time the place will get very hot, we should say unbearably so, in hot weather.

H. J.—1. We have no idea what can cause blue stain in the use of persulphate. A negative after persulphate reduction is very sensitive to stain from outside contamination, and apparently some chemical must have reached it by contamination from the fingers. 2. Both metol and hydroquinone may be discoloured and still work well, but there is no means of knowing whether this is so or not except by making up a bath of developer and trying it. 3. A very thin coat of backing will do in the case of ordinary subjects, but if there is liability to extra halation, you want a fairly substantial coating. If the backing is a mixture of caramel and pigment, the coating should be so thick that you could not read your own writing through it if you laid a plain piece of glass with the coating on it down on to the paper.

W. A. S.—Evidently your negative is not sufficiently strong, that is contrasty, for the printing paper. That is one cause of the degraded sky, and another probably is that the developer gradually got exhausted and you kept prints too long in it with the object of bringing them up to sufficient vigour. Your remedy for thin skies in your negatives is longer development or, alternatively, more of the stock solution of pyro and alkali in a given bulk of the tank developer. You can improve existing negatives by intensification, say, with chromium intensifier, but if you give reasonable exposure and develop long enough you should have no difficulty in getting ample density in the sky without needing to intensify. 2. Unless you can find somebody in your district to give you a few lessons the only thing for you to do is to take a week or two's course at the day classes of the Photographic School of the Regent Street Polytechnic, London, W.

B. B.—One is apt at the first trial to use too much of the wax medium, and that is probably one of the causes of its not drying quickly. Other causes are adulterants of tallow in the wax and paraffin in the turpentine. Roughly speaking, tested on glass the medium should dry in a few minutes, that is as, as soon as the solvent has evaporated it should revert to its former hard state. In practice all one wants is to reduce the wax to a solution to enable one to pass the colour over the portion in hand, and before it finally sets to smooth it to one's liking. Only the merest film of wax is required to hold the tint to paper. Wax medium is easily and cheaply made to your liking, and can be quick or slow drying according to the solvent used, hard drying by the addition of gum elemi or Canada balsam. Soap is added merely as an emulsifier, and can be dispensed with. If a very thin film of wax is spread on paper, dry powder colour, pastel or charcoal applied and then steamed, it will be found to hold the colour sufficiently. Such methods give a double value to pastel.

H. N.—Evidently the enlargements are splattered with some brown staining substance on the mounts as well as on the prints. Looked at through a magnifier the stains look exactly the same on both mount and print, and in that fact we think that you should have the strongest defence against any claims which are being made, for it is incredible that you would send out mounts stained in this way and equally incredible that your customer would accept them. From what you say, it appears to be suggested that the stains were not visible when the prints were received, but developed in some way on the photographs. While that would be conceivable in the case of the prints, it is inconceivable in the case of the mounts. We cannot venture an opinion as to the cause of the spots and markings. They have not the appearance of any which could arise from defective paper or from defects in making the prints. From the strong colour and density of the spots they certainly have the appearance of having been caused by tiny splashes of liquid Possibly splashes of permanganate would give rise to brown spots of this kind on both mount and print, but if, as we think, the spots are due to some liquid splashed on, there are, of course, hosts of substances which might have produced them.

The British Journal of Photography.

Line Advertisements.

Charges for Insertion.

Since advertisements cannot be inserted until fully and correctly prepaid, senders of line announcements are asked to bear in mind the scale of charges. They will thus save themselves delay in the publication of their announcements. A Schedule by which an advertisement can be correctly priced will be sent on request.

Net Prepaid Line Advertisements.

12 words or less	1/-
Extra words	1d. per word.

(No reduction for a series.)

Special Note. Box Number Advertisements.

"Box No." and office address	charged as 6 words.
For forwarding replies add ...	6d. per insertion for each adv't.

If replies are called for this latter charge is not made.

Advertisements cannot be inserted until fully and correctly prepaid.

Orders to repeat an advertisement must be accompanied by the advertisement as previously printed.

Advertisements are not accepted over the telephone or by telegram.

The latest time for receiving small line advertisements is 12 o'clock (noon) on Wednesdays for the current week's issue.

Displayed Adv'ts should reach the Publishers on Monday morning.

The insertion of an Advertisement in any definite issue cannot be guaranteed.

HENRY GREENWOOD & CO., Ltd., Publishers,
24, Wellington Street, Strand, LONDON, W.C. 2.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3093. Vol. LXVI. FRIDAY, AUGUST 15, 1919. Price Twopence.

Contents.

	Page
Ex-Cathedra	465
Holiday Complexions	466
Comparative Notes on Methods of Making Enlarged Negatives.—I.	467
Multiple Vignettes with Print-out Papers. By E. A. S.	468
Forthcoming Exhibitions	469
Practicus in the Studio. By Practicus	470
The Fundamental Law for the True Photographic Rendering of Contrast. By Alfred W. Porter, D.Sc., F.R.S., R. E. Slade, D.Sc.	471
Photographic-Vision Filters for Ortho-Chromatic Photography	474
Assistants' Notes	474
Self-Toning Paper	474
Press-Photographic Jottings. By Ranger	475
Photo-Mechanical Notes	476
Patent News	476
Analecta	477
Meetings of Societies	477
Commercial and Legal Intelligence	478
News and Notes	478
Correspondence— A Temporary Focussing Screen—Co-operative Holiday Closing of Studios—Federation and the P.P.A.	479
Answers to Correspondents	479

SUMMARY.

A contributed article gives working instructions in the making of multiple vignetted prints on print-out papers by a method which can be readily carried out by those without special skill in such work. (P. 468.)

A new feature—viz., topical notes on Press Photography—will be found on page 475. We may make it a regular one if sufficient support is forthcoming.

The astonishing suggestion is reported to have been made at an R.A.F. Photo-section dinner that "every town, river, railway, and road in the country" should be photographed from the air. (P. 478.)

If photographers cannot be persuaded to adopt colour-sensitive plates and a light-filter for sun-tanned, then at least the precaution should be taken to let exposure be on a very liberal scale. We refer to this question in a leading article on page 466.

A valuable new aid to the practice of orthochromatic photography is provided by the "photographic-vision" filters now being introduced by the Ilford Co. (P. 474.)

Methods for the making of enlarged negatives are the subject of some "comparative notes," in which the advantages and drawbacks of the various conjunctions of processes are passed in review. Those dealt with this week are on the enlarged-transparency system. (P. 467.)

The heat-wave presumably has made the article by "Practicus" of exceptional brevity. Its topic is the element of personality in the ordinary affairs of a studio. (P. 470.)

A paper by Drs. A. W. Porter and R. E. Slade reviews and revises certain incomplete studies of Hurter and Driffield in the theory of photographic printing. (P. 471.)

Time-saving hints on the making of copies form the subject of "Assistants' Notes." (P. 474.)

In the design of field cameras for professional use greater importance might well be laid upon rigidity of the lens-front if it is a question of sacrificing this feature to portability. (P. 466.)

The question of varying time or distance in the making of prints by artificial light is the subject of a practical paragraph on page 466.

The prospectus of the Royal Photographic Society's Exhibition is published, and announces September 20 as the latest day for the receipt of entries. (P. 465.)

EX-CATHEDRA.

The R.P.S. Exhibition. The prospectus of the forthcoming sixty-fourth exhibition of the Royal Photographic Society is, for some reason, very late in appearance, but is now obtainable on application to the Secretary, 35, Russell Square, London, W.C.1. It discloses the fact that in the pictorial section this year the society is planning a lighter and more pleasant appearance of the walls as a whole by stipulating, as has already been done from "another place," that exhibits be sent unframed, and that white or light-tinted mounts of one or other of the sizes, 16 by 12, 20 by 16, and 22 by 18 ins. be used. Passe-partouts of these sizes and tints of mount may, however, be sent. The latest days for the receipt of exhibits are September 19 by carrier and September 20 by hand, the exhibition opening on October 13. In the pictorial section the selecting and judging committee consists of Messrs. Bertram Cox, J. Dudley Johnston, and Alex Keighley. Messrs. F. T. Hollyer and W. L. F. Wastell select and judge pictorial colour transparencies, whilst those of technical or scientific interest will be judged by the committee in the general scientific section, consisting of Messrs. G. Ardaseer, Charles R. Davidson, Hugh Main, and Drs. Robert Knox and Geo. H. Rodman. Medals will be placed at the disposal of judges in the colour and technical sections, but not in that for pictorial work.

* * *

Reducing Contrast. It is generally believed that the persulphate reducer does not attack the thinner portions of a negative, confining its action to the high-lights only, but this is not altogether true. If this were so it would be possible to leave the image in the solution indefinitely, which we know is not the case. Therefore, it is well to remember that we have in the chromium intensifier a very useful means of improving negatives which have a considerable amount of thin shadow-detail together with dense high-lights which quite preclude the possibility of getting a really good print both in gradation and colour by any process. Any attempt at reduction will still further weaken the thinner parts, very much if the ferricyanide and hypo method is used, and less if persulphate be employed; with the latter, however, the high-lights are reduced in so much greater a proportion that they are printable before the shadow-detail is hopelessly buried, and a much more harmonious result can be obtained. If we adopt the chromium method we can not only reduce the high-lights but intensify the shadow parts, so that the finished negative will closely approximate to one which has received full exposure and correct development. The procedure is exactly the same as for intensification, with one exception, that the re-development with amidol is not completed but arrested at any desired stage by rinsing and transferring to a normal

fixing bath, which dissolves that portion of the dense image which has not been reconverted to the metallic state. Uneven development must be guarded against, and we have found it useful to blot off the surface moisture from the bleached image so that the developer commences its action evenly all over.

* * *

The Weight of the Lens. The tendency for some years past on the part of all camera makers has been to reduce weight and bulk as much as possible among all classes of apparatus, and even the field camera has been not unaffected by the general trend. There seems in our opinion in many patterns a decided want of rigidity in the front of these instruments that was not in evidence on apparatus made a score of years ago. The lightly constructed front is all very well if only the light modern anastigmats are to be employed, but if an older pattern of rapid symmetrical originally made to cover a much larger plate is fitted, the increased weight of such a lens tends to a decided loss of rigidity. It may even be that the camera front itself, if the instrument is of the tapering bellows pattern, is not large enough to accommodate such a large lens. In field-camera construction there is much to be said for the square-bellows pattern on the score of rigidity in that it will allow almost any make and weight of lens to be fitted without strain or lack of rigidity of the front during exposure; also there is no risk of cut-off when a lens of short focus is employed. We have no wish to decry the modern field camera, but this is one of those cases where improvement in one respect is made at the expense of lessened efficiency in others.

* * *

When a V.P. Scored. Yet another instance of the practical value of the vest-pocket camera came under our notice recently. A photographer was called in to take a group round the table at a children's tea party. The circumstances were against the production of a good result. The little sitters were of all ages and more or less restless. The group was in different planes, necessitating careful focussing and stopping down, and the light was bad. Two or three exposures were made with an ordinary field camera, and then almost in desperation the photographer ran off half a dozen rapid exposures upon a spool of film in quite an ordinary vest-pocket camera. When the whole of the exposures were developed, comparison proved almost an astonishing revelation. Each of the tiny negatives was in every practical point perfect, while those with the larger instrument showed that several of the little sitters had moved during the long exposure. From the selected negative several dozen prints were made through the enlarger which delighted the customer and enhanced the reputation of the photographer.

* * *

Time or Distance. There are, as every photographer knows, two ways of varying the exposure when printing upon bromide or similar papers. One is to give a longer or shorter time at a fixed distance, and the other is to vary the distance while the length of exposure remains the same. A combination of both ways is sometimes found necessary. At first sight it may appear that the same result would be arrived at by either method, provided that an exactly equivalent exposure were given, and this is perhaps true within certain limits of density in the negatives. But when abnormally thin or thick images have to be dealt with it will be found that the results obtained differ greatly in the matter of contrast. For such negatives variation of distance will be found to give not only the best gradation in the print, but in the case of very thin images of uniformity in depth and colour. Supposing that our exposure to a given lamp at a distance of one foot is eight seconds for a normal negative, and that we wish to print from a negative which requires only one-fourth of this time, we shall find that there is a great difference between two prints, one of which has received two seconds at one foot and the other eight seconds at two feet, while a still further difference will be found if the distance be increased to eight feet and the exposure to 128 seconds. Conversely with dense negatives the distance must be reduced, or if this becomes too short to secure even illumination of the negative a stronger light must be used. In all cases the exposure should be regulated so that the image is thoroughly developed, for by this only can good colour be obtained. Where a fixed distance only is available, as in printing boxes, the light must be reduced by the interposition of one or more sheets of thin paper, so that an exposure of sufficient duration can be given.

HOLIDAY COMPLEXIONS.

At this time of year the portrait photographer finds himself faced with the difficulty of having many sitters whose complexions would do credit to some of the lighter Indian races, yet who expect that their portraits will be those of ordinary white folk. It is said that in America those portraitists who have negroes or mulattos in their *clientèle* succeed in business according to the degree of whiteness of skin which they can confer upon their sitters, and the same thing holds good with holiday-makers here.

We do not think we are wrong in asserting that the majority of portrait negatives, taken under normal conditions, are under-exposed. In some cases this is done designedly to produce certain broad effects, but generally it is done without its being realised. If we look at any collection of portraits of sitters in dark clothing we find that there is little detail in anything except the face and hands, the drapery being very faintly defined. Now if this be so with a pale-faced sitter, what must it be when a bronzed complexion has to be dealt with? Fortunately, this problem presents itself at a time of year when the light is good and full exposures given without risk of movement. Three or even four times the exposure usually given will not be too much for extreme cases, and there need be no fear that light draperies will suffer in consequence; in fact, they will be improved in rendering because they will not be made too dense in the endeavour to bring the face up to printing density. Those who have done much copying realise the great increase in exposure necessary when working from an original upon toned paper, and the sunburnt sitter is rather more than "toned." The lighting, too, calls for some modification. More light can be admitted, and the reflector used freely without fear of flatness, and it will be found that the larger the aperture of the lens the more harmonious will be the result. From the scientific point of view it is correct to say that given the ordinary system of diaphragm apertures each step downwards from the full opening requires double the exposure that the preceding one did, but it does not hold good in practice with all classes of subject. If anyone doubts it, let him try two plates on a bronze figure or other article, one at $f/4$ and the other at $f/32$, giving the theoretical increase in exposure for the latter and develop both in the same dish for the same time. In colour photography, either by the screen-plate or trichrome process, much of the colour value is lost if a small aperture is used, and the same is true, to a smaller extent, in ordinary work.

It is, we fear, like ploughing the sand to suggest that rapid orthochromatic plates are preferable to ordinary

ones for all classes of portraiture. There are no difficulties or disadvantages connected with their use, and even without a screen they are helpful with any subject having a yellow or brownish tinge. Panchromatic plates we hardly dare mention, as they must be manipulated in total darkness, and it takes much persuasion to get most operators to believe that a good negative can be made without watching it through the development. Those who are free from this superstition will find that the latest introduction in panchromatics, the new Ilford plate of this type, possess remarkable powers of colour-rendering in an unscreened condition, while a light screen gives still better results. It is in colour-sensitiveness of the emulsion that the photographer of dusky complexions will find his most effective weapon, but if such means cannot be reconciled with his antipathies, the next best maxim for him is ample exposure of his ordinary colour-blind plate.

COMPARATIVE NOTES ON METHODS OF MAKING ENLARGED NEGATIVES.

I.

In these days of development papers and of the facility of enlarging, the making of enlarged negatives has naturally fallen into a lesser degree of importance to the professional photographer and perhaps interests chiefly the more serious type of amateur desirous of producing from his small negatives large prints in the oil and other processes which require an enlarged negative for daylight printing. Even professionals who do their own printing in carbon or platinum are apt to shirk the making of the enlarged negative when a carbon or platinum enlargement is called for, and to pass on such work to a trade house. Nevertheless, the variety of means by which an enlarged negative may be made is sufficiently great to offer a particular choice appropriate to the conveniences in the way of apparatus, etc., which are available or to the purpose for which the enlarged negative is required. Since in our experience both professional and amateur workers are oftentimes in doubt as to the relative merits of these means, it may be of service to many if we pass them briefly in review, not with the intention of offering working instructions, but with the object of indicating the advisable procedure in given circumstances. The making of enlarged negatives cannot be called a "process," since it consists simply in the conjunction or combination of processes which, for other purposes, are familiar to every photographer. The particular manner in which these processes are employed in conjunction appears to be a subject on which something may very usefully be said, and the present notes are intended to be read in that sense.

Generally speaking, the making of enlarged negatives follows one or other of two systems: (1) the making of a positive transparency the same size as the negative and its enlargement to produce the enlarged negative, and (2) the production of an enlarged transparency of the size which the enlarged negative is required to be and the making of the latter from this either by contact or, more usually, in the camera. From a consideration of the different materials which are available for the making of the intermediate transparency and the enlarged negative it will be seen that some dozen or so different methods may be followed. In order to provide a preliminary swift glance over these different methods we borrow from a past issue of the "Photo-Miniature" a shorthand representation of them devised by labelling as P1, P2, etc., the methods for making the positive transparency, and as N1, N2, etc., the methods for producing the enlarged negative from it. Thus, adopting this notation, we can bring within a very small space an outline of the methods and materials which are available.

PROCESSES FOR POSITIVE TRANSPARENCY.

Same size as original negative.	Same size as enlarged negative.
P1, dry-plate, or P2, carbon tissue, or P3, print-out paper.	P4, dry-plate or Transferotype or development paper.

PROCESSES FOR ENLARGED NEGATIVE.

From positive same size as original negative.	From positive same size as enlarged negative.
N1, dry-plate or film, or N2, bromide or Transferotype paper.	N3, dry-plate or film, or N4, bromide or Transferotype paper, or N4, carbon tissue.

COMPLETE PROCESSES.

No.	Positive.	Negative.
1.	P1, dry-plate.	N1, dry-plate or film.
2.	P2, carbon tissue.	N1, dry-plate or film.
3.	P1, dry-plate.	N2, bromide or Transferotype paper.
4.	P3, print-out paper.	N1, dry-plate or film.
5.	P3, print-out paper.	N2, bromide or Transferotype paper.
6.	P4, dry-plate or development or Transferotype paper.	N3, dry-plate or film.
7.	P4, dry-plate, development or Transferotype paper.	N4, bromide paper, Transferotype paper.
8.	P4, dry-plate, development or Transferotype paper.	N5, carbon tissue.

Perhaps the first question which arises from a study of the above table is whether choice should be made of a method of working from a small transparency or from one of the full-size of the enlarged negative. What is gained by the expenditure of two large plates as against one, and are there any disadvantages attached to the former system? The enlarged-transparency method is beyond question the most perfect process of making an enlarged negative where one requires the opportunity of carrying out improvements by working up or by rubbing down, or, indeed, by any form of retouching. On this account it is the method greatly favoured by leading pictorial photographers whose work is done in platinotype or in carbon. We have the recollection of Mr. W. R. Bland having confessed somewhere that one article in these pages years ago, commending this form of the enlarging process, had in itself amply repaid him for a twenty years' subscription to the Journal. Moreover, apart from this question of retouching in one shape or another, the enlarged-transparency method offers a facility and precision in the insertion of clouds or skies into the enlarged negative which is not yielded by the system of working from a small transparency. Against these advantages must be set the necessity, if plates are used, for a camera taking a plate the size of the enlarged negative and also for proper means of illuminating the enlarged transparency. If dry-plates were of such perfect flatness that a 12 x 10 negative could be printed by contact from a 12 x 10 transparency, these requirements would obviously disappear, but in the use of ordinary dry-plates it is necessary that the transparency should be copied same size in the camera in order to secure satisfactory definition throughout all parts of the image: also there are those who are ready to maintain that a higher quality of enlarged negatives is produced in this way. The disability of the enlarged-transparency system in this respect has been removed to some extent by the introduction of the Eastman Portrait film, which, for moderate sizes, may be used as the sensitive material for the enlarged negative, and can be printed quite satisfactorily by contact in a frame of the solid build such as is used for carbon printing. Similarly, an alternative to the use of transparent portrait film is bromide paper, Trans-

ferotype paper or carbon tissue, as represented by processes 7 and 8. The use of bromide or Transferotype paper reduces cost considerably, while on the other hand it does so at some sacrifice of quality, and, moreover, is much less convenient for the addition of clouds or skies. The slowness of printing, in the case of bromide, is a further disadvantage, whilst the slight grain of either bromide or Transferotype paper limits the employment of the enlarged negative to papers having a matt or rougher surface. Probably for a very large proportion of the uses to which enlarged negatives are put by the pictorially inclined worker, this latter is by no means a drawback. With these qualifications it may be said that the enlarged-transparency system recommends itself to those who, working chiefly for pictorial ends, have at their disposal a large copying camera and the means, preferably a window looking upon a clear sky, for the illumination of the transparency.

The merits of the system according to which a small transparency is enlarged are almost too obvious to need pointing out: the more debatable considerations arise in selecting the material for the enlargement of the small transparency and also for the making of the transparency itself. These must be deferred to a succeeding article.

MULTIPLE VIGNETTES WITH PRINT-OUT PAPERS.

In the case of bromide and gaslight papers multiple vignettes present little difficulty with register lines on the back of the paper, which, in one well-known method, is caused to travel and a fresh surface exposed for every negative in turn. In the absence of some special contrivance, this is not possible with daylight printing papers, and if one were devised it is doubtful whether it would present any advantage. It therefore follows that it is compulsory to use a printing frame large enough to take the strip of paper, and in the majority of cases it is also obligatory that two successive printings be employed, for the reason that in the print the distances required between the vignetted heads is usually less than the distances between the same points when the negatives are laid side by side in contact. Consequently, they cannot be printed simultaneously unless the negatives are cut down, which, for various reasons, is often not desirable. In the method to be described this is presumed to be so, and although it originated with the writer, there is no doubt it has frequently been evolved, being a plan more or less forced on one by the conditions, though details of procedure may vary.

The idea was to so scheme out things that the general set-up might be handed to any intelligent young lady printer, who, after familiarising herself with the hang of the thing, should experience no difficulty in printing the multiple vignettes, and it was found successful in practice. Feminine nature is stated to be complex, and this may be so, but assuredly it does not respond sympathetically to undue complexities in printing.

The Guide Print.

A piece of white paper is first cut the size of the printing paper to be employed. Rough proofs (preferably fixed) from the negatives are trimmed close to the subject and stuck down in correct position on the paper. With standing figures vertical lines cutting them truly can be made on the proofs, and a set-square applied to them, and the bottom of the paper will ensure the figures standing upright.

The position, spacing, etc., will depend on the subjects and the taste of the printer, but often the chins are placed equidistant from the bottom of the paper. Before the prints are stuck down, horizontal lines are ruled across them, roughly at right-angles to the vertical, and cutting the extremities of the chins: a horizontal line ruled across the paper at the right distance from the bottom will ensure this. It is quite necessary to have the guide print correct, as it is the basis for the subsequent setting-up. Finally, the proofs are given consecutive numbers, numbering from left to right in the customary way, and the negatives are plainly marked to correspond.

Outline of Procedure.

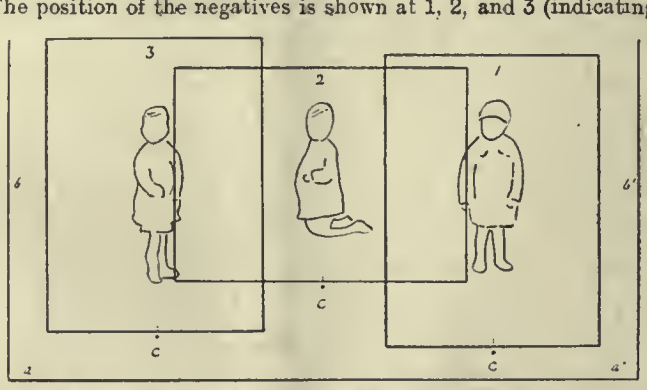
In the following notes a triple vignette is taken as an example, but exactly the same principle applies to any number of negatives. Briefly, it consists in assembling them in a cardboard carrier behind a multiple immovable vignette, with openings appropriate to the negatives to be printed underneath. It is therefore necessary that they occupy the correct position in the printing frame relative to each other and their corresponding opening in the vignette. With a triple vignette the centre negative is, say, printed first with the openings in the carrier on either side masked out to prevent any possible action by stray light. The remaining two negatives are then printed together with the space between them masked out. In both cases the openings not in use in the vignette are covered. Accordingly, we have to make a card carrier, the vignette, and two masks, and devise some simple scheme for registration.

Procedure.

A piece of white tissue paper is taken larger than the guide print, is placed over it, and the outlines of the subjects are boldly traced, taking care no shift occurs whilst doing so. Mark also by lines or dots the position of the bottom and sides of the guide print. Remove the tissue paper, turn it over, and repeat all lines on the side now uppermost. Consecutively number the subjects from *right to left*, and mark the paper "film side."

At the bottom of every negative make a mark (for registration) on the film of the rebate. Place the negatives in turn, film uppermost, on the tissue paper so that the image corresponds with the lines drawn, and with a pencil draw round the edges of the glass, and also place a dot against the registering mark. If the negatives are dense, this may have to be done by transmitted light.

The diagram illustrates affairs so far as we have now got. The position of the negatives is shown at 1, 2, and 3 (indicating



their position in the card-carrier subsequently to be cut out). The bottom of the printing paper is indicated at a, a^1; the sides at b, b^1. The registering marks c are not in all cases necessary, but they insure exactitude, and are no trouble to include.

The Masks.

It will be apparent from the diagram that when the middle negative is being printed a space will be left on each side through which light may creep from the central vignette—edges of negatives have a nice trick of catching stray light and distributing it where it is most decidedly not wanted. These spaces, therefore, require protection, together with the clear rebate of the negative being printed.

The mask is made by laying down another piece of tissue paper of the requisite size on the diagram and tracing round inside the central rectangle; about ¼ in. clearance will more than allow for the rebate. The paper just drawn upon is turned over, a dab of gum is placed within the rectangle, and the tissue paper is stuck down on orange paper and the rectangle cut out. In the same way, a second mask is made to shield the central space when negatives 1 and 3 are being printed, and also protecting their rebates. The masks should not extend so as to cover the lines indicating the bottom and sides of the printing paper.

The Multiple Vignettes.

Again, we lay another piece of tissue paper on the diagram (or on the guide print if the images show through the tissue), and the amount of each subject is traced, taking care no shift occurs. The tissue paper is stuck down on brown paper or thin card in the same way as mentioned for the masks, and enables the three vignette openings to be cut out in exactly the right position relative to each other. Mark the side on which the tissue was stuck "under-side."

The Card Carrier.

We now take the diagram and on the reverse side put dabs of gum well distributed over the inside of the three rectangles, and stick it down on card. Prick through a, a^1, and b, b^1, and also the registering dots c. The boundaries of 1, 2 and 3 are then cut out and the lines representing the bottom and sides of the printing paper are reproduced with a pencil. A touch of the pencil to the pricked dots c will make them plainer.

Assembling.

The card carrier is inserted in the printing frame, and, if not an exact fit, is attached to the glass by gummed strips. Negatives 1 and 3 are placed in their respective openings in the carrier. If a reasonable fit, well and good; if not, the registering marks on the negatives and dots on the carrier will ensure exact positions, and applied gummed slips temporarily retain them.

A piece of white paper is put behind the negatives and the back of the frame inserted. The vignette is then adjusted by sight; if correctly placed for 1 and 3 it will also be right for the middle negative. Should inspection be difficult owing to density of the negatives, the subject can be previously outlined on the glass side with white water-colour pigment, which is washed off after the adjustment.

Printing.

If a print-out silver paper is employed, inspection in the usual way will indicate which of the negatives require printing up, the vignette openings over any negatives sufficiently printed being covered. With platinotype or allied papers a skilled printer doubtless could do the same, but large frames are awkward to handle, and in all cases small trial prints are desirable to test the vignetting. If these are exposed with a print-meter (the single-tint type being specially recommended), the exposures for the final compound print can be ascertained. Should printing be conducted by mercury light, the question is merely one of time variation. The carbon process should present no difficulty with trial pieces of P.O.P. as a guide to exposure, but has not been tried by the writer.

The way in which the negatives are inserted has already been mentioned. In the present case, negatives 1 and 3 occupy niches of their own, preventing material shift, but it is obvious there is nothing to indicate the correct position laterally of No. 2, which is free to slide either way, and requires registration as described, and also affixing by gummed slips. The registering lines a, a^1, b, b^1, ensure the printing paper being replaced in the same position after it has been removed on a change of negatives.

Remarks.

The foregoing method may seem somewhat formidable, and although no difficulty arises in setting-up, it certainly does take some time, but time well spent if certainty of results and ease of printing be considered; moreover, five or six negatives can be dealt with as easily as three.

A question may naturally arise: why employ daylight printing papers for the job when bromide papers, affording more facility, are available? The answer will largely depend upon the printing medium generally employed, and, possibly, to some extent upon the price charged. As a prominent professional and keen business man put it to the writer: "I really haven't the face to charge several guineas for a worked-up multiple vignette, and supply it, maybe, on precisely the same paper as used by the cheap studio over the way."

E. A. S.

FORTHCOMING EXHIBITIONS.

September 13 to October 11.—London Salon of Photography. Entries close September 2. Hon. sec., 5a, Pall Mall East, London, S.W.1.

SHEFFIELD AND DISTRICT PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.—A meeting was held on Wednesday, July 30, and by the kindness of Miss E. M. Eadon her fine studio and workrooms were placed at the disposal of the Association for the purpose of a demonstration of "tank development," given by Mr. J. H. Lawrence, of the Kodak Co. Plates and flat films were exposed in the studio and then developed in tanks. Mr. Lawrence gave a very interesting lecturette on tank development while development was proceeding, and explained that "whatever the exposure—within reason, of course—a negative would be got by tank development that would have the right contrast. Numerous questions were asked by the large and interested gathering of members, and a most enjoyable and profitable evening was spent. A hearty vote of thanks was accorded to Miss Eadon for opening her studio for the occasion, and to Mr. Lawrence and The Kodak Co. for a very good demonstration. Business was relegated to the annual general meeting which takes place next month.

RESTRICTION OF IMPORTS.—Lord Parmoor, in the House of Lords on August 6, asked the Government under what authority the executive had placed an embargo on the importation of goods and commodities other than arms, ammunition, and gun-powder. He said that in the "Board of Trade Gazette" there was a very wide range of goods or commodities which could not be imported into this country without a licence. In his opinion it was not right that the executive Government, by its own operations, should be able to discriminate and give licences to some traders and refuse them to others, because that power was undoubtedly capable of corruptive use. The system tended to keep up prices, which was one of the most fertile causes of industrial unrest. Lord Emmott asserted that protection by prohibition, subject to licence, was the very worst form of protection that could possibly be devised in time of peace. Lord Somerleyton replied that the restrictions on the importation of goods were imposed by Royal proclamation, the Act under which the proclamations were drafted being the Customs Consolidation Act, 1876. The Law Officers of the Crown had advised the Government that the words "any other goods" in that Act ought not to be treated *ejusdem generis* as "arms, ammunition, and gunpowder," and that the present restrictions on imports were within the law.

PRACTICUS IN THE STUDIO.

[Previous articles of this series, in which the aim of the writer is to communicate items of a long experience in studio portraiture, have appeared weekly since the beginning of the present year. It is not thought possible to continue the series to the length of that by the same writer which ran through the "British Journal" some years ago, but if any reader among the younger generation of photographers, and particularly those engaged as assistants, has a particular subject which might be dealt with, his or her suggestion will be welcomed. The subjects of the previous articles of the series have been as follows:—

A Talk About Lighting (Jan. 3).
The Camera and the Lens (Jan. 10).
Managing the Sitter (Jan. 17).
Backgrounds (Jan. 24).
Studio Exposures (Jan. 31).
Artificial Lighting (Feb. 7).
Printing Processes for Portraiture (Feb. 14).
Studio Accessories and Furniture (Feb. 21).
The Surroundings of the Studio (Feb. 28).
Studio Heating and Ventilation (March 7).
The Postcard Studio (March 14).
The Printing-Room (March 21).
About the Reception Room (March 28).
Home Portraiture (April 4).
Portable Studios (April 11).
Copying (April 18).
Handling the Studio Camera (April 25).
More About Lenses (May 2).
Enlargements (May 9).
Advertising the Studio (May 16).
Mounts and Mounting (May 23).
Business Methods (May 30).
Photographing Children (June 6).
Portraits of Elderly People (June 13).
Something about Lenses (June 20).
Hand Cameras for Professionals (June 27).
The Dark-Room and Its Fittings (July 4).
Plates and Their Work (July 11).
Apparatus Repairs and Renovations (July 18).
Posing the Head (July 25).
Intensifying Portrait Negatives (Aug. 1).
Workshop Jobs (August 8).

THE PERSONAL FACTOR.

If a photographer wishes for the best possible results from his business he must be able to do more than merely take photographs; he must sell them, and, further, he must, in the majority of cases, sell them before he takes them. Probably in no calling save that of a medical practitioner's does personality count for so much as in portrait photography. The doctor must inspire confidence by having a good "manner." If he is a little brusque, it does not materially affect the cure, but the expression evoked by the photographer is perpetuated in the portrait, and no amount of manipulative skill will destroy a glum or bored look. I have known several good, sound craftsmen who have struggled on for years, turning out excellent prints, but never making headway. The reason was almost identical in each case. One was more suited for an undertaker by temperament, though I am told that undertakers off duty are jovial souls. Another was apologetic in his demeanour towards his clients, while a third always gave the impression that he had been interrupted in some tremendously important work. All these failed to realise, or perhaps they were constitutionally unable to act up to it that to be successful the portraitist must be "all things to all men."

The standard of good manners is not the same in all localities, but it may be taken that it is always safe to treat even the humblest sitters as if they belonged to a much better class. They appreciate it, and applaud the judgment of the photographer, perhaps to the extent of increasing their order forthwith. If, on the other hand, really first-class people turn up, and in country districts the photographer meets with every grade, there should be no display of servility, no fussing round, with "my lord" or "my lady" interpolated in every sentence. Good manners should be backed up by a good appearance. The words which Shakespeare puts into the mouth of Polonius cannot be improved upon as advice to a business man: "Costly thy habit as thy purse can buy, yet not expressed in fancy, for the apparel oft proclaims the man." Let me hasten to explain that this does not mean a velvet jacket and a flowing tie. One must establish a cult before these can be indulged in nowadays, and even then I don't think that there is much money in it. The average sitter, whether citizen or Society lady, feels most confidence in a well-behaved man whom one might meet on 'Change or in the Park. Once this idea of personal neatness is adopted, it will naturally spread to its immediate environment, and an untidy studio or reception room will become unthinkable. Our photographer, although possessed of a considerable amount of firmness, must yet be pliable as far as the wishes of his clients are concerned. Some men will be simply rude, perhaps, without knowing it when a customer makes what he considers an absurd suggestion. Such should be received as worthy of consideration, but difficult, if not impossible, of execution, and a very different impression will be produced.

A failing with many photographers is that of trying to please their customers by promising prints at an impossibly early date. This shows weakness of mind, and a desire to avoid immediate unpleasantness. If a photographer is honest, and tells a sitter that he can supply no more portraits for delivery (say) before Christmas, it does not follow that he will lose the order. As a matter of fact, a lady said to me, in such circumstances, "Well, if I went to someone else, they would probably promise, and not send them. I will sit now, and send them in the New Year." If I had promised and not supplied she would have had no opportunity of sending any other souvenir at Christmas, as she probably did.

Besides customers, most photographers have other folk whose goodwill has to be obtained and kept, and these are his assistants. If there is a thorough feeling of *esprit de corps* throughout an establishment, it means much not only in comfort of working, but in actual cash. Waste and delay are avoided, and if any special effort is needed, it will be made cheerfully. A well-trained staff does not want familiarity from the principal, but it appreciates consideration, and when there is a fitting opportunity a little generosity, either in the way of a cash bonus or an excursion or garden-party, not at the expense of the staff, but as a graceful act on the part of the one most interested.

Thus, what is wanted is a sedulous cultivation of the art of "getting on" with people, no matter in what way they are encountered. It is not easy to learn, but if the need is always kept in view, some measure of success is certain.

Practicus.

THE FUNDAMENTAL LAW FOR THE TRUE PHOTOGRAPHIC RENDERING OF CONTRAST.

[The following paper by Dr. Alfred W. Porter and Dr. R. E. Slade is almost the first to be published as the result of the establishment of the British Photographic Research Association, in which Dr. Slade is Director of Research. By reprinting it from the "Philosophical Magazine," we wish to mark our desire to include within the pages of the Photographic Press original papers such as it, which contribute to the advancement of the scientific treatment of photographic problems. EDS. "B.J."]

THE modern treatment of the character of a photographic plate is based entirely (in England, at any rate) upon the method of examination introduced by F. Hurter and V. C. Driffield in a paper read before the Society of Chemical Industry and printed in their journal dated May 31, 1890. The advance that was made by these authors was so great and the utility of their method so advantageous compared with previous methods, that the whole photographic world has joined in according them the honour due to their insight into the problem.

Nevertheless, a certain *malaise* is often felt in regard to the logical foundation of their method. Perhaps they themselves are to blame for this, because one of the important steps in their chain of arguments is made in so cursory a fashion (in a single sentence) that any reader must simply assume it to be correct unless he himself develops the argument in all its detail from the beginning.

The whole argument is this*:—"Since the density is the logarithm of the opacity, and since in a theoretically perfect negative the opacities are directly proportional to the intensities of the light which produced them, it follows that each density must be proportional to the logarithm of the light intensity which produced it." They add, in brackets: "More correctly the density is a linear function of the intensity of light and time of exposure."

Unfortunately, in making this detailed examination, one of us (A. W. P.) has recently discovered that their principal conclusion is erroneous when regarded as a general principle. We shall first of all describe such a detailed examination and then discuss in what respects difference is found from Hurter and Driffield's results.

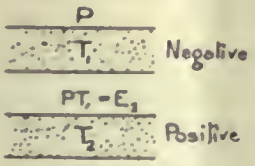
The problem deals with the taking of a negative followed by the printing of the negative on to another plate or paper, and investigates the conditions under which the final positive gives a true rendering of the contrasts in the original subject. There are several parts to it.

When the plate is exposed to the subject (exposure $= E_1$) a certain density of deposit is produced, and the negative has a certain transparency T_1 in consequence after development.

Taking stage.

Fig. 1.

In the second place, a print is made by exposing the positive plate (or paper) through the negative. Let the printing light be P. Where the transparency is T_1, the light getting to the negative is $PT_1 = E_2$; this exposes the positive, producing a transparency T_2 after development.

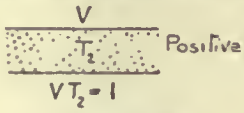


Printing stage.

Fig. 2.

Finally, this positive is viewed under an illumination V (the viewing light), and the light that issues from it is $VT_2 = I$.

Since for a true rendering of contrast it is necessary to have the same ratio between light emitted from two portions of our final picture as that which fell in the camera from the two corresponding portions of the subject, we must have $I = KE$ where K is a constant reduction factor. Now, this relation between the first and last



Viewing stage.

Fig. 3.

lights concerned in the process involves a connection between the relative transparencies of the positive and negative plates. Hurter and Driffield defined the transpareney T as $\frac{\text{Light transmitted}}{\text{Light incident}}$.

They also make use of a correlative quantity, the *density* D of a plate, the connection between these quantities being

$$\log\frac{1}{T} = \text{density} = D.$$

It should be observed that since T is always less than unity, its reciprocal $\frac{1}{T}$ is greater than unity and its logarithm is positive.

Now, $I = VT_2$ from the definition of transparency.

But if also

$$I = KE_1,$$

we have

$$\frac{E_1}{T_2} = \frac{V}{K} = \text{constant.} \quad \ldots\ldots\ldots\ldots \quad (1)$$

Similarly,

$$E_2 = PT_1,$$

whence

$$\frac{E_2}{T_1} = P = \text{constant.} \quad \ldots\ldots\ldots\ldots \quad (2)$$

The first of these equations states that the transparency of the positive must bear a constant proportion to the light from the subject at all corresponding points. The second equation states, what is only the direct result of definition, that the light transmitted by the negative is proportional to the transparency of the negative itself. Both of these equations must be caused to be true simultaneously by a suitable choice and treatment of the two plates.

To examine these equations further it is convenient to take the logarithms (to base 10) of both sides of each, and write

$$D_1 = \log\frac{1}{T_1}, \quad D_2 = \log\frac{1}{T_2},$$

whence from (1)

$$\log E_1 = \log\frac{V}{K} - D_2, \quad \ldots\ldots\ldots\ldots \quad (3)$$

and from (2)

$$\log E_2 = \log P - D_1. \quad \ldots\ldots\ldots\ldots \quad (4)$$

Let us suppose that the connection between D_1 and $\log E_1$ is known. It is represented graphically by the characteristic curve usually obtained for a plate (Fig. 4).

The above equation will enable us to determine the values of D_2 and $\log E_2$ for a plate that will form a suitable positive. Such plates which suit one another as negative and positive we may advantageously refer to as *conjugate* plates. The former equation (3) asserts that we can obtain a suitable value of D_2 by taking any constant (the same for all points) and subtracting $\log E_1$ from it. This is equivalent to shifting the origin to any point O′ and measuring D_2 backwards from it; thus if OM represents a particular value of $\log E_1$, then O′M represents the suitable value of D_2. On the other hand, the second equation (4) asserts that the suitable value of $\log E_2$ is obtained by taking any constant (the same for all

* Journ. Soc. Chem. Ind. May 30th, 1890.

points) and subtracting D_1 from it. This is equivalent to still further shifting the origin to any point O″ and reckoning log E_2 *downwards* from it. Thus if O′N represents the value of D_1, then O″N represents the suitable value of log E_2. Hence the same point Q represents not only the corresponding values of D_1 and log E_1, but also, when measurements are made as indicated from the new origin O″, it represents the corresponding values of D_2 and log E_2. Since this can be said for every point Q in the characteristic curve for the negative, it follows that this curve *suitably interpreted* gives

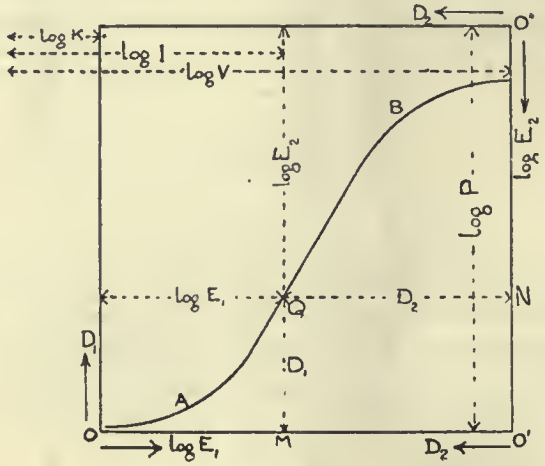


Fig. 4.

the characteristic of the conjugate plate also. We may express the transformation most easily by saying that if the characteristic curve D_1, against log E_1, be drawn on tracing paper and be then viewed *from the back* so that the first origin O is at the top right hand corner, the curve, as it then appears, is the characteristic curve of the conjugate plate. Such a curve is shown in Fig. 5 for comparison.

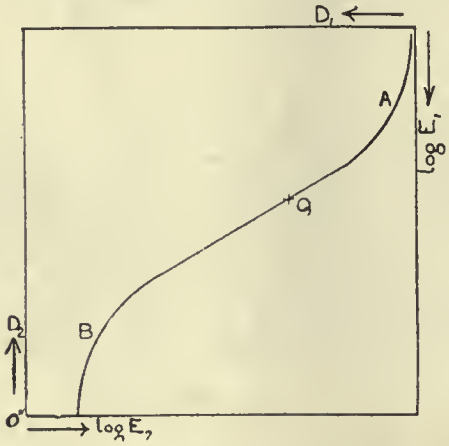


Fig. 5.

It should be carefully remarked that the new origin O″ may be any point whatever. But it must not be forgotten that the constant amounts by which it is shifted in the two directions are connected with the viewing light and printing light. In fact,

$$OO' = \log [\text{viewing light} \div K] = \log V - K,$$
$$O'O'' = \log [\text{printing light}] = \log P.$$

To choose the point O″ is equivalent to deciding upon particular values for the printing and viewing lights and the reduction factor K. The more nearly K is to unity the more nearly will the light from the positive be not only the same in gradation as that from the subject, but also the same in *absolute* intensity.

When we make a print we arrange our exposure so that the curve of the paper is in the best position with reference to the axis of log E_2 to be brought by development to fit the conjugate curve; then we develop until this fit is obtained. We must not develop longer or this fitting of the curves would be spoiled.

In what respects do these conclusions differ from those of Hurter and Driffield? Their great conclusion was that it was necessary and sufficient that D should be a linear function of log E for a sensitive plate, i.e.,

$$D = \gamma(\log E - \log i).$$

This conclusion appears to have been arrived at by considering a single kind of plate only for both negative and positive, but they do not state exactly what assumptions they made. If we derive from our general results, this case in which the two plate curves by supposition are identical, it follows that

$$D = \log E - \log I$$

for each; or, in other words, γ can only be equal to unity. No other curve but this can fit its conjugate. Hence the conclusion that γ may have any value in such a case is erroneous. In a later paper * on the relation between photographic negatives and their positives, they carry the question further and conclude that

$$D_2 = \gamma(\log P - aD_1),$$

which is somewhat similar to our fourth equation; but they only give arbitrary values to a, and the value of γ is also quite arbitrary.

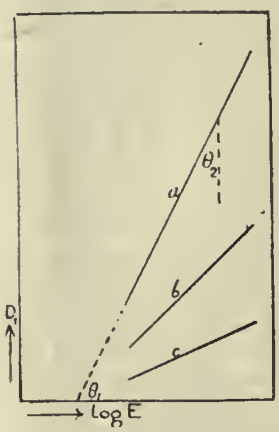


Fig. 6.

It would seem, then, that as the result of a somewhat quick judgment they were led to an imperfect conception of the true conditions for securing a true representation of gradation. The true result is in one case more special than theirs because for similar plates the value of γ must be unity; it is also more general than theirs because we are not constrained to keep to the linear function at all. We will examine in detail some particular cases.

Case 1.—Suppose we follow the customary theoretical practice

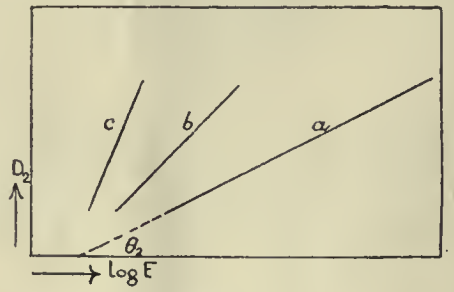


Fig. 7.

and restrict ourselves to a negative in which the straight portion of the characteristic has been utilised. So that

$$D_1 = \gamma(\log E_1 - \log i_1).$$

By plotting Fig. 6 and viewing from the back it is seen at once (Fig. 7) that for the positive the necessary conjugate relation is

$$D_2 = \frac{1}{\gamma}(\log E_2 - \log i_2).$$

The constant log i_2 is arbitrary, as we have said before, and $\gamma = \tan \theta_1$.

A low characteristic curve for the negative requires a steep

* Journ. Soc. Chem. Ind., February 28, 1891.

characteristic curve for the positive print. In fact, $\theta_1 + \theta_2 = 90°$, where θ_1 and θ_2 are their respective inclinations to the horizontal exposure axis. In real cases, only the central part of the curve is straight (Figs. 4 and 5). Since the conjugate curve is obtained from the curve of the positive simply by a change of origin and axes, the length of the straight line portion in the two curves is the same, although the projections on the exposure axes are different in the two cases unless γ is equal to unity Hence, in order that the two plates may match, the straight parts utilised in each characteristic must be the same in length. Generally this is possible in lantern slides or other transparencies. In the case of paper the straight line is very short; it is therefore only the gradations corresponding to a portion of the curve for the negative which will be correctly rendered. The particular part reproduced correctly depends on the printing exposure. Whether any part is correctly rendered depends on the development, for the development factors must be made reciprocals of one another (γ for the one and $\frac{1}{\gamma}$ for the other). These considerations show that if the subject presents a wide range of gradations and it is treated so that these correspond to the straight part of the curve, then development of the negative should be stopped early, so that the straight part utilised is as short as possible (for γ increases with development). The print then should have a high γ, which may be obtained partly by choice of plate or paper and partly by prolonged development, so as to make the paper curve as long as possible. For subjects with only a small range of gradation these considerations are of less moment. The three curves in Fig. 6 all correspond to the same range of gradation in the subject; with increased development the straight part required increases. The corresponding portions of best positive curves which require to be straight are shown in Fig. 7. The lines *a*, *b*, *c* on Fig. 6 require to be matched by the corresponding lines *a*, *b*, *c* on Fig. 7. Since the straight part on paper curves is short we require the part of the curve on the negative corresponding to extreme range of exposure to be as short as possible—*i.e.*, we require the negative to have a small γ; consequently the print must have a big γ.

This conclusion is at variance with that arrived at by Jones, Nutting, and Mees ("Photographic Journal," liv. p. 342, 1914). They point out that the latitude of plates may be as high as 128 in exposure units, although the contrast in most subjects is not more than 1 to 34; they conclude that the negative is easily capable of satisfying what is required of it. But a paper has only a latitude of 5.6 exposure units (.75 in log E_2), and they say: "The paper, then, will only render correctly a range from 1 to 5.6; hence it is obvious that in order to render a negative having a range wider than 1 to 5.6 in transmission, it is necessary to utilise portions of the characteristic curve lying outside the latitude of the paper and thus depart from direct proportional rendering."

This conclusion on their part illustrates a prevalent fallacy that the range of contrast on the exposure scales of the negative and of the positive must be alike. Consider, however, a paper for which the latitude is 0.75 in log units and for which γ_2 is 1.5. This is shown in fig. 8, where

$$\tan \theta_2 = \gamma_2 = 1.5.$$

The curve of the negative which will be correctly printed by this paper under these conditions has $\gamma_1 = \frac{1}{\gamma_2} = \frac{1}{1.5} = 0.67$, and reproduces a range *ab* on the log E_1 scale which is given by $0.75 \tan \theta_2 = 0.75 \times 1.5 = 1.12$. This corresponds to a ratio of 1 : 13 in exposure units. Thus though the exposure latitude of this paper is only 1 : 6.6, it will correctly reproduce a latitude in the camera exposure of 1 : 13 and not only the 1 : 5.6 as these authors take for granted.

Case II.—It is not compulsory, however, to work in the straight portions of the curve as Hurter and Driffield thought to be necessary. Examination of the curve B'B in fig. 9 will show that this possible extension is of limited availability. No sensitive material known will yield such a curve as is shown in this figure throughout its whole length; but this is necessary to give a true photographic reproduction.

In fig. 9 we see that the curve of the paper *pqr* will fit over a certain range of the conjugate curve B'B. Thus we can reproduce correctly over a short range of contrasts in the original by using both the under exposure portion of the negative and of the positive printing process. This portion of the curve is often used in practice, and the two curves BB' and *pqr* shown in fig. 9 are actually those of an Ilford Empress plate and a piece of Illingworth Slogas paper (Vigorous) respectively.

Again, for over-exposed negatives, the shape of the conjugate

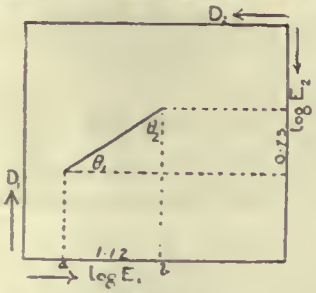


Fig. 8.

curve is A'B' (fig. 9). We can only get the over exposure portion of the curve of a print to be of this shape. Moreover, such prints would not represent any portion of the original subject by white paper, and therefore such a print is usually of no pictorial value.

When this paper had been drafted and while it was being copied out, our attention was called to the Traill-Taylor Lecture, given by Mr. Renwick in 1916, in which the same question of matching the negative and positive is discussed. In this lecture Mr. Renwick gives what he calls reciprocal curves for the positive and negative respectively; but he does not describe how they have been obtained. In the absence of such a description it is not possible for us to test how far his work overlaps or anticipates ours. But

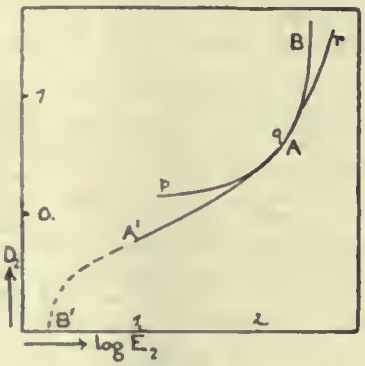


Fig. 9.

he certainly does not touch the validity of Hurter and Driffield's conclusions.

We have also found a paper by Lord Rayleigh "On the general problem of photographic reproduction with suggestions for enhancing gradation originally invisible" (Phil. Mag. xxii. p. 734 (1911)), reprinted (British Journal of Photography, lviii. p. 994 (1911)). In this paper Lord Rayleigh certainly goes to the root of the matter so far as the matching of plates is concerned, but does not leave the problem in a form suitable for practice. In particular, some of the assumptions made in the typical cases taken do not fit in with practical aims. For example, there is no object in making the gradation of the negative the same as the positive. The only condition which seems to us useful is that the gradation in the issuing light (I) shall be the same as that from the original source (E_1). This is the condition which we have taken as fundamental.

ALFRED W. PORTER, D.Sc., F.R.S.
R. E. SLADE, D.Sc.

SOFT-FOCUS PORTRAITS.—Wanting to try my hand at soft-focus portraiture and not caring to invest in a special lens, I tried the effect of using an old portrait lens with the back combination removed. The results were surprisingly good.—A. S. D., in "Camera Craft."

SELF-TONING PAPER.

From Rajar "Trade Notes."

THE present great demand for self-toning paper prompts us to offer a few hints on its successful working. Although its keeping qualities are good, the paper should be used as quickly as possible, and if there is a slight discolouration this will be cleared away in the fixing.

Failures to obtain good colours or tones are tabulated below, the first one being by far the most prolific cause of poor tones:—

1. "Drowning" the gold that is incorporated in the emulsion by using too great a bulk of solution for the number of prints. The rule to observe is to use only sufficient fixing-solution to just comfortably cover the prints.

2. Using an old fixing-bath that has done duty for plates, etc. The hypo-solution must be freshly made, and no other ingredient added.

3. Too weak a fixing-bath. A good strength is 5 to 6 ounces of hypo to a pint of water. This gives fine brown colours on our "Autona" paper, with no trace of double tones.

4. Prolonged washing after fixing may spoil the prints. One hour in running water is ample.

For amateurs, and for dealers who specialise in "finishing" amateurs' work, the self-toning process gives beautiful prints, and provided the fixing is properly done, the results can be said to be permanent.

The time of fixing with a bath of 5 ozs. to the pint should be ten minutes at about 60 deg. Fahr. Longer immersion in the fixing-bath may reduce the prints considerably. Prints that have been over-printed can be fixed in a stronger solution, or for a longer time in a normal solution, thus taking advantage of the slight reducing action.

Some amateurs place their self-toning prints in a combined toning and fixing solution as used for P.O.P., and to these we must point out the necessity, for permanence sake, of afterwards fixing them in a bath of plain hypo (2 ozs. to the pint of water) for ten minutes.

PHOTOGRAPHIC-VISION FILTERS FOR ORTHO-CHROMATIC PHOTOGRAPHY.

THE manual "Panchromatism," just issued by the Ilford Company, and the subject of reference on another page, contains a description of the new P.V., or Photographic-Vision filters, the issue of which is being made sooner than was suggested by their originator, Mr. F. F. Renwich, in the paper before the Royal Photographic Society in which the principle of the new filters was outlined. Since the practical facilities which the P.V. filters confer cannot be too fully understood, and as the latter constitute an entire innovation in orthochromatic photography, we reprint here the passage from the Ilford publication which deals with them:—

These filters are an altogether new introduction, and constitute a valuable application of colour screens to photography. The principle upon which they depend is quite easy to understand; they cause coloured objects viewed through them to assume the same relative tone values as will appear in photographic copies made by means of the plate for which the filter is designed. For example, an ordinary plate, being sensitive to blue and violet only, and blind to pure green and pure red, renders these latter colours as black; hence it has always been possible roughly to appreciate what the record of a coloured scene will be like when made on an ordinary blue-sensitive plate, by examining the scene or object through a pure blue-violet filter such as the Ilford tri-colour blue filter. If, however, an orthochromatic (green sensitized) plate like the Ilford Chromatic plate is to be used, no previously devised filter will assist the photographer to any certain knowledge of what will be the order of luminosity assigned by the plate to the various parts of the subject if he makes an exposure. This is done by the Ilford P.V. Iso filter; while, when an Ilford Panchromatic plate is to be used, the Ilford P.V. Pan filter fulfils the same function.

A little consideration will show what an extremely valuable tool such a filter is for the user of colour-sensitive plates. By mere inspection of the proposed subject through the P.V. filter he can, after a very few trials, judge fairly accurately the order in which the plate will record the colours present *when no filter is used*. He can then proceed to study the effect of using any filter he likes to try, simply by looking through it and the P.V. filter together, and so can select for use that filter which will give him the tone relationships he prefers, without having to waste time and material on that guess-work photography which so often leads to disappointment. At first the majority of people find difficulty in deciding upon the order of brightness of a number of differently coloured things, but, provided their sense of colour is normal, this phase of uncertainty soon almost disappears, though small differences of luminosity between widely different colours are always difficult to recognise with certainty. We have no hesitation in saying, however, that our P.V. filters are a most valuable aid to the photographer even at the start, for by studying the effects produced by our Iso, Alpha, Beta, and Gamma filters on a brightly coloured test object when it is looked at through each with the P.V. filter as well, he will be astonished at the results of his observations, and will speedily appreciate the meaning of what he sees and the effects of the correcting filters. Having once grasped the meaning of luminosity (apart from colour) of a coloured object, he will then be able to select with certainty the best filter for any work on hand by the aid of the P.V. filter.

Assistants' Notes.

Notes by assistants suitable for this column will be considered and paid for on the first of the month following publication.

Some Simple Copying Hints.

OWING to the war and its losses, and the number of men and women who have now permanently put aside their uniforms, there is an immense field in copying and enlarging for the photographer to work upon; and in order to get such work through as well and expeditiously as possible, many photographers might overhaul their working methods for copying with advantage, and bring them well up to date. This would ensure better copies being turned out more quickly than before.

For one thing, the copying easel or board might be made a permanent and ever-ready fixture. A little thought given to its even illumination by artificial light would ensure that many a slack half-hour in the dark evenings would be turned to good account, and copies would not need to be kept hanging about indefinitely, waiting for a spare hour and good daylight.

The work turned out by the trade houses and by photo-engravers is really wonderful. Photographers might well take a leaf out of their books, for it is only careful thought and planning that has brought their methods up to so high a pitch of perfection. A few suggestions, therefore, may not come amiss.

Often a print is brought in for copying, and some explanatory text matter is desired to be added to it. The usual way seems to be to copy, make a rough print, add the required wording, and copy again. Usually, something of the quality is lost in each fresh negative made. Usually the print is too precious to be worked upon or tampered with. Another method might be tried, however. Get a few sheets of the very *best* and most transparent tracing-paper or linen, mark round the edge of the print, and cut out of the sheet. Fasten on to a drawing-board, and carefully and smoothly paint all the framework of the tracing paper with that kind of opaque white paint known as "process white," as used by photo-engravers. There is a special brand made by Windsor and Newtons, which, in my experience, seems to photograph a purer and cleaner white than any other—always a difficulty when a new negative has to be made. When this white mask is perfectly dry, add the necessary wording in "process black." When dry, carefully adjust the mask over the print to be copied, cover with a piece of perfectly clean glass, bind together with passe-partout binding, and proceed to copy in the usual way. I take it for granted, of course, that a slow or else a "process" plate is used for making the fresh negative, as they give so little grain, yield so much better results, and in case of any slight error in the exposure respond so much better to treatment during development than do faster plates.

One thing I think photographers often fail to realise, and that is the amount of time that could be saved in the finishing department if only a little more were expended on making and preparing the

copy negative. How often does it happen that something like the following takes place?

The printer or operator takes a negative to the retoucher: "Oh, Miss So-and-so, just spot this copy-neg., will you, and let me have it in a few minutes; soon as ever you can, will you?"—failing to realise that perhaps one hour of that retoucher's time spent on that one negative would save as much time spent on each one of perhaps six dozen prints in the spotting room. It is such simple logic, yet heaps of photographers don't seem to realise it. It repeatedly happens that an enlargemnt is first ordered, and then, perhaps, later, a few dozen contact prints; and think of the working up that might be saved if only that copy-negative had not been so rushed. Then, again, there are one or two little preparations on the market that both save time and give better results. One of these is the deep red matt varnish, which, if spread over parts that refuse to print properly white and carefully scraped away from the back of the negative to the required outline, gives far better results in a few minutes than the slow and laborious dabbing on and working down with the finger of red paint, as practised by scores of photographers. Also it enlarges infinitely better. Then such things as Billdup make it far easier to lighten a part that prints too dark, with stumping-chalk, and so on; while, after much labour expended on a copy-negative from which many prints have to be made, many photographers omit the perhaps rather bothersome process of hot varnishing, but which well repays the little extra trouble in the protection from scratches and accidental damage it affords a much valued negative.

I saw a little dodge in use some time ago which struck me as being very clever. We all know the great risk there is in copying delicate platinotype and carbon prints, from which, perhaps, one figure has to be taken out of a group and part of a figure worked in. Well, the method I saw was as follows:—A number of carbon prints needed this treatment, and each one was covered with a piece of the *finest* quality clear celluloid lightly fastened to it with gummed strips. The blocking out was then done on the celluloid cover with very smoothly mixed *oil*-colour and finest sable brushes, so that practically no brush strokes showed. Backgrounds were added and covered up; legs added and hands blocked out in this way in comfort, and with no risk to the prints. They were then put up and copied in the usual way on non-screen plates, and I was very surprised at the excellent results obtained. Then, once the negatives were made and passed, the celluloid was very gently washed with best turps and cotton-wool and was ready for use again, so long as no scratches showed. There is also a special kind of transparent paper made for the use of photo-engravers, and called, I believe, "frisket" paper, which would probably serve the same purpose.

Where cloudy effects, etc., are wanted in backgrounds and no air-brush is available, a quick method is to use a stiff tooth-brush dipped in the required colour and held bristles down over the part of the print to be covered. The bristles are then scratched towards the user with a match or brush handle, which makes them shoot out a fine spray of colour in tiny spots. A little preliminary practice should be tried to get the knack of the thing, but it is really very often quite a quick way to cover a large space. Water-colour, of course, should be used, made up in bulk ready for use in a saucer.

Where wording of a small size has to be put in or under a print, and is done by the finisher, it could often be better done with black waterproof drawing-ink and a pen which is fairly thick and does not smear, than by the water-colour and brush method usually employed. There are also little handbooks of the letters of the alphabet in all styles of type, published by Vere Forster and, I think, George Rowney, which are sometimes a most useful guide to the perplexed finisher, who must put dates, titles, etc., on albums of finished copies and mounts and outside covers, and all these details help to make copying both more paying, satisfactory, and easily accomplished. In the absence of an enlarger, a pantograph is a useful little tool, used, of course, with a blunt point—say a brush handle or bit of stick in lieu of the pencil, to give the exact size to which a figure should be enlarged, reduced, or photographed, for inclusion in a group and any similar thing, or for making a mask to use in combination prints, and so forth. A few thicknesses of matt celluloid are also sometimes useful when printing on bromide paper from a poor negative, when no slow paper is at hand, and will avoid intensification when this is not possible. It is so free from grain that it is better than matt varnishing or the use of tissue paper.—G. E. H. G.

Press-Photographic Jottings.

News items, opinions, etc., expressing the interests of press photographers will be welcomed by "Ranger."

Fleet Street—the Fleet Street of Press photographers—is awake again. Many of its well-known camera men have returned after years of naval and military service. I notice that Messrs. B. and T. Grant have returned to the "Daily Mirror," also Messrs. Castle and MacLellan. Mr. H. Baldwin, formerly Australian Official Photographer, has established his own business in Fleet Street. R. Silk is with the "Daily Mail"; G. Limbery and H. Outram have opened larger premises in Johnson's Court, near to Richardson, late of the R.A.F.; Rider, Rider, and Brooke, late official photographers, are now busy again in Fleet Street.

* * * *

Now that the official photographers have returned, what will be their reward in the shape of decorations? There is no doubt that their work was very arduous and dangerous. We must not forget the loss of a leg by Mr. A. Console, the illness of Mr. Brooke, and the discharge of Mr. H. Baldwin on the ground of ill-health. It should be the part of someone in authority to get them public recognition, first from the British authorities, and then from the Allies. Inasmuch as official war photographs were enjoyed by millions throughout the world, surely their makers should be recognised?

* * * *

Many of the boys are having a very "cushy" time just now at the seaside, combining business with pleasure. During August there is always a good demand for bathing pictures. It is by no means an easy job to think out fresh "stunts." The mere group of bathers, or overbacks, is played out. Certain it is that American picture papers make a better show of this class of illustration than we do.

* * * *

One does not realise the number of cameras which are in daily use. The Cenotaph, with its base covered with flowers, has been photographed at the rate of about 100 cameras per hour. Soldiers, sailors, girls, men—all classes of people—have been among the photographers.

* * * *

Police permits for photographers are now being issued to professional Press photographers. Each permit is a folder bearing the holder's photograph, and certifying that the bearer is an accredited and responsible photographer, and is recommended for all facilities. It is signed by Sir C. Nevill Macready and Sir J. N. Nott Bower.

* * * *

A recent reproduction in the "Daily Graphic"—showing about ten camera men "taking" a bride and bridegroom—raises a nice point as to whether it is quite dignified for the operators to be jostling one another amongst the tombstones—or so it seems.

* * * *

Press operators have had a very busy time just lately. How many have received double pay for working on Peace Day?

* * * *

Almost all the newspapers still keep up their war prices: there is no likelihood of a return to the halfpenny pictorial, which makes one ask—When are photographers going to increase the minimum reproduction fee? Some of the Press Agencies have put up their fees, but I don't think it is general.

* * * *

I wonder when British camera makers are going to produce a new 5 x 4 or ¼-plate folding camera with a lens working at *f*/3 and of 7 ins. focal length? Something light, serviceable and strong, with single slides.

Ranger.

Photo-Mechanical Notes.

Photo-Engraving Stencils.

Do any readers know exactly how reproductions are made by stencil in somewhat the same way as a typewriting stencil is made? We understand a piece of muslin is taken and covered with a solution of bichromated gelatine. Then, after it is dry, an exposure is made to a positive, if a positive is required, developed in water, fastened to a frame, paper placed underneath, and an ink roller applied. The insolubilised gelatine prevents the ink going through in parts, but it can get through the muslin where the colloid has been dissolved away, namely, the places that were under the black image of the positive. This would seem to be a perfectly practicable process for line drawings. Has it ever been used for half-tone with success? And what is the formula for the sensitizing solution?

Labour Shortage and Its Effects in America.

At present in both the United States and Canada there is a demand for engravings that is almost beyond the capacity of the business to take care of with the amount of labour available. This has led to high wages and to employers tempting men from one establishment to another by the offer of still further increases. So that the retention of the labour force has become a problem which at least two of the firms in the Middle West are attempting to solve by introducing the shop committee, and sharing profits. The committee elected by the men are allowed to formulate their own working conditions and suggest their remuneration, which, however, is not much, if any, above the standard rate—the standard rate being in most towns very considerably above the trade union minimum just now. Their incentive to production and loyalty comes from the share of the profits they are entitled to. The method so far adopted is to establish the value of the capital of the firm, which is preferentially entitled to 8 per cent, and after this is paid the remaining profits are divided among the staff. There is no doubt that this is an entirely satisfactory scheme so long as business is brisk and the management from the selling end is thoroughly competent. But if the selling should be incompetent, or some accident, such as bad debt or a fire, should wipe out the profits, it is doubtful if the workpeople, who have put extra effort into their work in anticipation of extra reward which will not be forthcoming in such case, will be quite so satisfied.

It has always seemed to the writer that profit-sharing is not ideal from the workman's point of view, because so many elements over which he has no control may enter in to vary the amount of profit and consequently render futile his extra diligence, so that he is soon likely to get into his previous habit of taking things fairly easily. Moreover, the payment of profit is usually so far distant from the time that it is earned, that the connection between the work and its reward tends to disappear. On the other hand, a system of bonus on production is difficult to apply in complicated work like photo-engraving, where each piece differs from every other, and two pieces apparently exactly alike may require very different amounts of labour to be spent on each to produce a saleable result. As the processes become more and more subdivided, these differences tend to become less, and if the bonus was reckoned over a large number of engravings they would average out. Any shop introducing a bonus system would have to do a considerable amount of work in standardising methods, and make very careful studies as to what is a fair day's work for the normal standard wage, on top of which they would pay the bonus for extra production.

In any case, it is clear that something has to be done, for it is apparent that a loyal and contented staff cannot be retained in present circumstances unless they have some share of the management, at all events so far as concerns their working conditions, and some incentive not to "ca-canny."—A. J. N.

A Good Retouching Medium.—The best retouching medium that I have ever used is one that I got from a demonstrator about five years ago. It is made as follows:—Red rosin, 3 ozs.; turpentine, 6 ozs.; sulphuric ether, 2 ozs.; beeswax, 30 grs. The rosin is dissolved in the turpentine by means of gentle heat, and to this is added the beeswax, previously dissolved in the ether.—G. T. B., in "Camera Craft."

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Applications July 28 to August 2:—

Shutter Tester.—No. 18,680. Testing speed and effectiveness of photographic lens shutters. H. A. Cummins.

Printing.—No. 18,699. Photographic printing. W.V.D. Kelley and J. Mason.

Developing and Fixing.—No. 19,000. Apparatus for developing and fixing photograhic films. A. R. Turner.

COMPLETE SPECIFICATIONS ACCEPTED.

Roll-Film.—No. 122,391 (June 9, 1917). The invention consists in providing a light-excluding wrapper (for roll-films, pack-films, etc.,) having a waterproof coating in its inner surface, *i.e.*, in the surface which comes in contact with the non-sensitive side of the film; or with a waterproof coating on both sides. Both sides of the light-excluding paper are waterproofed, so that it may not give off anything that might impair either the face or back of the film, and the rear face of the film is waterproofed to prevent it from absorbing any matter which might stain or discolour it. As the film must, when developed and fixed, be transparent, it is necessary that the water-proofing composition should be transparent, and it is likewise important that it be highly flexible and quite tough or tenacious, so that the film may be rolled upon a spool, or wound from one spool or reel to another without breaking, cracking or reeling off. Nitro-cellulose is found to fulfil admirably these conditions, but other waterproofing agents may be used if preferred, as, for instance, cellulose acetate. Arthur Williams McCurdy, 83, Crescent Road, Rosedale, Toronto.

Tripod Stands.—No. 129,601. (March 15, 1919.) Each leg of the improved stand is made up of three sections, the two upper sections being of a channel formation, being each formed with a longitudinal groove respectively along their entire length. The middle leg section, which is preferably made of wood, is adapted to slide within the groove in the upper section (which may be made of sheet-metal) when it is desired to collapse the stand, the lower member of the leg (preferably in the form of a metal tube) being arranged, in a similar manner, to slide within the groove in the middle section, so that the three sections telescope one within the other. In order to hold the middle section rigidly in its extended position it is provided at the upper end of its inner face with a central screw or stud which is adapted, on the middle section being fully extended, to engage within a slot formed in a metal plate attached by bent-over ears to the sides of the lower end of the top section. On the stud entering the slot the two upper members of the leg are rigidly held together and any side play prevented. To hold the lower leg-section, which is of a circular cross-section, in its extended position and to prevent any rotation or side play a similar arrangement is employed, the upper end of the bottom section being provided with two longitudinally separated screws or studs adapted, when the section is extended, to engage with a longitudinal slot in a metal plate, the latter being provided at each side with a pair of bent-over ears whereby it is attached to the lower end of the middle section of the leg. James Ashford, Aston Brook Street, Birmingham.

Shock-Absorbers for Cameras.—No. 129,011 (Sept. 19, 1917). For the support of cameras attached to aeroplanes and in other positions where they are exposed to vibration, a flexible chamber or enclosure is used filled with aerated rubber cuttings (sponge rubber).

The method of making such shock-absorber consists in providing a rectangular block of wood or other material provided with transverse grooves, encircling the block with a band of fabric, placing resilient tubes in the bottom of the grooves, fastening them in place with thread and end buttons, removing the block,

attaching a bottom to the band of fabric, and filling the band with cuttings of resilient material. William Johnson Greer, 18, Chiswell Street, Finsbury Square, London, E.C., and Luther Archibald William Martin, 77, Tavistock Avenue, Walthamstow, Essex.

PHOTOGRAMMETRIC CAMERAS.—No. 119,033. (Sept. 2, 1918). In photogrammetric apparatus it is known to use a cross of wires, hairs or fibres close in front of the sensitive plate or film. The vertex of the cross lies in the optical axis of the photographic lens and the cross is taken directly upon the picture when the photograph is taken. Crosses of wires, etc., have, however, the disadvantage that when the apparatus is applied to a vehicle, i.e., to an aeroplane, it is subjected to vibration, so that the cross is not fixed upon the picture with the desirable accuracy and sharpness. This disadvantage is avoided by a cross consisting of metal strips having their widths perpendicular to the focal plane. Into the rear extremity of the camera is set a cross formed by metal strips, in front of the focal plane in such a manner that the angular point of this cross lies in the optical axis. It will be seen that when taking a picture this cross and therewith the optical axis are taken upon the picture, the coincidence of the angular point of the cross with the optical axis being guaranteed once for all. Nicola Stefani, Calprino, Tessin, Switzerland.

LANTERN SCREENS.—No. 128,873 (Feb. 21, 1919.) Fabric is first treated with size solution and then with asbestos in paint form. It is claimed that the pores of the fabric are filled so that it becomes light-proof and the lines of the fabric are obliterated.

The screen is then treated with a mixture of gold size, terebene, turpentine and aluminium powder in paint form to produce a silver white surface. Robert Gilpin, 22, Holmwood Villas, Gander Green Lane, Sutton, Surrey.

AERIAL CAMERAS.—No. 128,637 (Aug. 20, 1917). The camera comprises mechanism for giving an intermittent movement to roll-film and for automatically protecting the film from light-action when in motion. The core of the film-roll is of such size that the first lap of film around the core will constitute an integral number of pictures or a single picture. The take-up roll is intermittently rotated by means operable from a continuously rotating spring-actuated shaft, and the shutter mechanism comprises an endless apertured blind intermittently movable. The film during the periods of movement is between the apertures in the blind and back thereof, and an aperture of the blind successively exposes portions of the film during the periods of rest of the film. There is a fluid-carrying chamber having connected ports adjacent to opposite ends, and a plunger engaging in the chamber is connected to the continuously rotating shaft to have longitudinal movement imparted thereto by the movement of the shaft during the feeding of the film and the actuation of the shutter to regulate the movements thereof through the shaft. The shaft is continuously rotated by a spring, and in which the take-up roll is intermittently rotated to advance the film by a mutilated gear fixed to the shaft co-operating with a mutilated pinion connected to the take-up roll, and means is carried by the gear to co-operate with means connected to the pinion to cause a toothed portion of the pinion to mesh with a toothed portion of the gear. Wheels are provided to support the blind, and in which the movement of the blind is controlled by escapement mechanism. These wheels are actuated to move the blind by a pinion rotatable with the shaft. A second pinion is driven through an intermediate pinion from and in the same direction as the first pinion; a gear is fixed to the shaft of the second pinion, and a pinion rotatable with one of the blind wheels meshes with the gear. The escapement mechanism is controlled by the first and second pinions to operate the gear intermittently. H. G. C. Fairweather, 65-66, Chancery Lane, London, W.C.2, for G.E.M. Engineering Company, 1216, Walnut Street. Philadelphia, U.S.A.

Trade Names and Marks.

APPLICATIONS FOR REGISTRATION.

CHALLENGE.—(Scotsman Design) No. 388,871. Photographic cameras. The firm trading as J. J. Lizars, 101, Buchanan Street, Glasgow; manufacturers. March 4, 1919.

OSDA.—Nos. 392,325 and 392,326. All goods included in Classes 39 and 8 respectively. The Houghton-Butcher Manufacturing Company, Ltd., Clifford Road, Walthamstow, London, E.17; manufacturers June 14, 1919.

E. P. G. Design.—No. 391,449. Photographic paper. Eric Purselove Glover, 5, Park Lane, Leeds, Yorkshire; manufacturer and publisher of photographic specialties. May 21, 1919.

Analecta.

Extracts from our weekly and monthly contemporaries.

Woodland Photography.

Fog and mist are sometimes useful in summer as a means to obtain greater differentiation in tone between planes of the scene and presenting foliage in flat masses when some decorative, poster-like effect is wanted; but, as a rule, main dependence should be placed upon finding just the right angle of lighting. During the long days of summer (writes Mr. Wm. S. Davis in *Photo. Era*) the nearly vertical rays of the noonday-sun is more likely to produce a spotty effect in the foliage than earlier or later in the day. On the other hand, when the sun is very low, there may be a lack of lighter tones in dense woods—even the foreground may appear dull and heavy because of the absence of light and shadow for accents. The best hour can be found only by visiting the same spot at different times, as every composition varies somewhat in such matters as the density of foliage and grouping of trees. When the ground is uneven, the direction of its slope affects the play of lights and shadows over the surface; it is possible to obtain pleasing cast shadows on a slope facing the sun when the latter is low. On a northerly slope, one might have to work near noontime to get any effect of light and shade. The presence of slight haze is often a great help to soften the intensity of the illumination; it keeps contrasts within more controllable limits without in any way lessening the play of light and shade characteristic of sunshine.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

SATURDAY, AUGUST 16.

Hackney Photographic Society. Outing to Woolwich.

TUESDAY, AUGUST 19.

Hackney Photographic Society. Print Competition: "A Market Scene."

WEDNESDAY, AUGUST 20.

Tonbridge Wells Amateur Photographic Association. "Colour Exhibition."
North Middlesex Photographic Society." Landscape Photography." E. C. Ridge.

THURSDAY, AUGUST 21.

Hampshire House Photographic Society. "Photographic Chemicals." R. L. Scorgie.

CROYDON CAMERA CLUB.

Mr. C. SMYTH gave a very practical chat on the manufacture of light-filters, a subject on which he is entitled to speak with the voice of authority. It was mainly a repetition of a previous discourse given some time ago; since then many new members have joined, and may live to bless the lecturer for an introduction to a craft of peculiar attractiveness. One or two of his previous audience have expressed a strong desire to apply a full measure of correction to the expert himself, as a slight return for value received.

Mr. Smyth said light-filters might be considered in many aspects, but he proposed to deal only with the mechanical side that evening. Coating glass with dyed gelatine was out of the question owing to the pull on the glass which occurred on drying. Consequently, a dyed sheet of gelatine had to be sandwiched between two glasses, optical contact being obtained by cementing the three with canada balsam. He then proceeded to explain how the dyed gelatine sheets were made, evidently a job demanding long experience to avoid the many failures which threatened on all sides, one best left alone by the great majority.

Much valuable and interesting information was afforded, of

which only a few salient points can be alluded to. The chief difficulty of the novice is undoubtedly the cementing, and pools of balsam solution, often applied, tend to air bells and an unnecessary distribution on surrounding objects. He strongly recommended purchasing the day canada balsam (very expensive at the moment) and dissolving it in xylol, in preference to other solvents. The viscosity should be about half that of golden-syrup.

A thoroughly cleansed and polished cover-glass is laid on a flat surface. For a small filter a drop of the solution is placed on the centre; the film is adjusted to the glass; another drop is placed on the film, and the remaining cover-glass placed over. It is important that these operations be conducted as speedily as possible. Central pressure by a finger drives the balsam to the edges, the air being pushed in front. The filter is then dried for about a fortnight at a temperature of 80 Fah., and moderate size filters do not require any superimposed weight. Exuded balsam is cleaned off with methylated spirits; more powerful solvents should not be used as they are apt to penetrate between the glasses. Start with swansdown (washed to remove "loading") and finish with best quality tissue paper. Although Mr. Smyth omitted to say so, with the "all fingers and thumb" fraternity by this time the apparel worn during the balsaming, together with the table-cloth, carpet, etc., may have returned from the dry-cleaners and all, except the filter, will be well.

Many things also dealt with, such as the selection of suitable glass, are now quite well known, or should be, as *ex-cathedra* paragraphs have a partiality for pointing out that glass of inferior flatness results in inferior definition. Quite apart from this, in days gone by the disadvantage of putting a filter in front of the lens has been alluded to, as tending to start a game of badminton with forward projected flare spots. Others have advanced reason against placing the filter behind the lens, and insertion between the combinations may play "Old Harry" with the corrections of some anastigmats. Accordingly the only really safe position for the filter appears to be the inside of its case.

In the discussion Mr. F. C. Reynolds congratulated the lecturer on so ably filling the bill and the blackboard. He asked whether the centre of the filter ever set. Mr. Smyth replied it never went dry. (Export to U.S.A. should be prohibited). Mr. H. King, whose powers of observation are evidently not on the wane, had noticed that the price charged for gelatine film tri-colour filters were materially less than for optical flats. He found the films cockled a little, and inquired whether this affected definition. "No," said Mr. Smyth, an answer which suggests the possibility of a corrugated film filter, opening and closing in concertina fashion, and affording various multiplying factors. Mr. Cavendish Morton had observed a certain waviness in the gelatine in a set of 15 by 18 cemented tri-colour filters. The lecturer said he had stopped short at 10 by 8, presumably referring to filters, for expressed either in inches or feet, he looks neither the height nor the girth. A most hearty vote of thanks was accorded him.

Commercial & Legal Intelligence.

NEW COMPANIES.

Leonardson and Co., Ltd.—This private company was registered on August 5 with a capital of £3,500 in 2,000 "A" pref. shares of £1 each, 110 "B" pref. shares of £10 each, and 8,000 defd. shares of 1s. each. Objects: To acquire the business of a photo-engraver, artist, designer and technical photographer carried on by G. S. Coles at 12, Botterton St., W.C., as "Leonardson and Co." (subject to liabilities) for £1,000. The first directors are: S. Spooner, The Leys, Little Clacton, editor and journalist; G. S. Coles, 31, Holmesdale Avenue, East Sheen, S.W., photo-engraver. Registered office: 12, Betterton Street, Drury Lane, W.C.

Premier Film Printing and Chemical Co., Ltd.—This private company was registered on August 6 with a capital of £20,000 in £1 shares (10,000 pref.). Objects: To carry on the business indicated by the title. The subscribers (each with one share) are: F. J. Whitlock, 9, Bank Street, Rugby, estate agent; H. Eaden, 15, Church Street, Rugby, solicitor. The first directors are: F. J. Whitlock (chairman), H. Eaden, B. Morris and H. A. Browne. Qualification, £100. Registered office: Upper Grove Street, Leamington.

LIMITED PARTNERSHIPS.

Allies Studios.—Photographers, 265, Kensington, Liverpool. Parnership commencing May 20, 1919, for six months certain, terminable thereafter by three months' notice. General partner: H. Apted, 58, Romer Road, Kensington, Liverpool. Limited partner: A. Keith, 31, Wheatlands Lane, Wallasey, contributing £100 in cash.

News and Notes.

Mr. W. A. Furse, for many years with the C. P. Goerz Optical Work (London) until his resignation of that position shortly after the outbreak of war, has established himself as a dealer in cameras, lenses, and other apparatus, and in the printing and developing of negatives, at 27, Chancery Lane, London, W.C.2. Mr. Furse's long experience in the sale of high-class apparatus specially qualifies him for the patronage of those who wish to buy a good article and can appreciate the advantage of going to a retailer who is himself an expert. Mr. Furse is also selling (and buying) second-hand cameras and lenses, in which branch likewise his customers will benefit by his technical qualifications. We wish him well in his business.

R.A.F. Photographic Section.—The first annual dinner of photographic officers of the Royal Air Force was held on Monday last at the Café Royal, Regent Street. Major F. C. V. Laws presided, and among those present were Lieutenant-Colonel Moore Brabazon, M.P., Major P. R. Burchall, and Major Gamble.

Major Laws (according to the "Times"), in proposing the toast of "The Photographic Officers," said that on the Western Front it was recognised that British aerial photography was ahead of that of all the Allied forces, and far in advance of that of the Germans. In Germany the Imperial Air Ministry issued a statement, at least six months ago, that aerial photography was a science created by the war, and they must not allow it to slip from their fingers. He hoped the British Air Ministry would appreciate the value of the science as soon as possible. Every town, river, railway, and road in the country ought to be photographed from the air.

The toast of "General Trenchard, Colonel Moore Brabazon, and the Training Division" was also honoured.

Panchromatic Photography.—A publication which will contribute in very large measure to an understanding knowledge and use of panchromatic plates has just been issued by Messrs. Ilford, Ltd., as "Panchromatism." It is a twenty-four page pamphlet of folio size containing a large number of reproductions illustrating some noteworthy applications of panchromatic plates. But it will be bought and studied for its very admirable presentation of the principles and facts of colour and the relation of colour-sensitive plates and light-filters thereto, and on that account we must heartily recommend it to the notice of all who are interested in sharing the photographic triumphs which the panchromatic plate puts easily within reach. Incidentally the monograph is a demonstration of the very great advance in the manufacture of panchromatic plates made by the Ilford Company in their "Special Rapid Panchromatic," an advance which does much to remove the prejudice against panchromatics existing among photographers who are not compelled to employ them by the fact of competitive results made on them. The treatise sets forth the disabilities attaching to the use of panchromatic plates, and thereby makes them look small in comparison with the benefits obtained. It also contains a description, part of which we quote on another page, of the new means in the shape of "photographic-vision" filters by which the need of judgment or guesswork is in very large measure removed from the use of panchomatic plates and light-filters for correct translation of colours into monochome. This is a new power which will be appreciated as much by the landscape photographer as by the professional copyist of paintings and pottery. The booklet, inclusive of a colour test chart for use in tests of particular combinations of plate and filter, is issued at 6d., post free 9d. It must cost several times this amount to produce.

Correspondence.

. *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

. *We do not undertake responsibility for the opinions expressed by our correspondents.*

A TEMPORARY FOCUSSING SCREEN.

To the Editors.

Gentlemen,—A simple method of making a screen, which, while it may be properly termed temporary, will last quite a long time, is to rub paste smoothly over a piece of glass; when quite dry rub over a very small quantity of oil. This will be nearly equal to ground glass.

E. A. NORTON.

CO-OPERATIVE HOLIDAY CLOSING OF STUDIOS.

To the Editors.

Gentlemen,—I do not quite see how *all* photographers can afford to close their studios for a whole week, and that at a time when every other business is on holiday. In some studios, where the clientele is more or less of the moneyed or leisured classes, and a large number of hands are employed, the plan of closing for a week is undoubtedly the simplest and easiest way to give all employed their holiday with the least interference with business.

Also, the studio that depends largely on factory workers, when the bulk of the sittings are on a Saturday, may quite easily close during the general holiday, as the hands mostly spend their money on trips, etc., and wait until afterwards to get photographs taken.

But there is one thing that seems to be forgotten in this holiday question. Owing to the Early Closing Order, every studio has to close at the same time as the shops of grocers, drapers, and various other trades, and the assistants and others employed in these businesses are never at liberty except when the studios are closed. Another thing that should be altered is this: Instead of advertising that the principal studios of —— will be closed, and *not* taking the trouble to ask *all* the photographers to join in, those who want to close should put their names to the advertisement, as some of the shopkeepers do, so that the public may know whose studios they are.—Yours faithfully, SINGLE-HANDED.

[The above letter was unfortunately received just too late for appearance last week.—Eds., "B.J."]

FEDERATION AND THE P.P.A.

To the Editors.

Gentlemen,—I have to thank Mr. Fry, hon. secretary of the P.P.A., for his courteous rejoinder to my query as to whether "the Council of the P.P.A. are alive to their responsibilities," and I will promise him that when we have our next district meeting his offer shall be considered and acted upon.

Mr. Fry, speaking for the Council, is in agreement with us as to the value of local and district associations in all matters affecting the interests of photographers in definite localities.

When possible, these should be organised and managed by members of the P.P.A., and one suggestion I would make is that such association should have, in due time, *direct* representation on the Council of the parent association, with the status of accredited branches.

I know these and similar suggestions were discussed in the good old convention days, when the ordinary and obscure provincial member was permitted to rub shoulders with the "big wigs" of London town, but the war has set back all those schemes of development and made the work of the Council difficult and perhaps disheartening.

However, we look for a return of the conference next year, and in the meantime let photographers in each district get together in the early autumn and form real live groups of hearty co-operation, knowing that if they prove themselves worthy of recognition the Council of the P.P.A. will receive them in fellowship and reward their endeavours, perhaps in the way I have suggested.

The P.P.A. should by this time be a strong federation of numerous county and district associations, instead of practically a small executive, the members of which to a large extent represent no one but themselves, and I say this in no disparagement of the service they seek to render to the general body of members.—Faithfully yours, S. H. GREENWAY.

Abington Street, Northampton.

Answers to Correspondents.

SPECIAL NOTICE.

In consequence of general reduced supplies of paper, as the result of prohibition of the importation of much wood pulp and grass, a smaller space will be available until further notice for replies to correspondents.

Moreover, we will answer by post if stamped and addressed envelope is enclosed for reply: 5-cent. International Coupon, from readers abroad.

The full questions and answers will be printed only in the case of inquiries of general interest.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

J. COOK, JUN.—Yes, by pressure in press at a greater heat.

K. K.—We certainly think that the starting of a business in outdoor photography, even from a private house, will be a breach of the agreement.

L. E.—In the absence of any written arrangement as to a period of probation, there is no doubt that the retoucher is entitled to a week's salary and a further week's salary in lieu of notice.

W. F. We have no knowledge as to the commercial manufacture of the range finder Your best course would be to address an enquiry to the patentee, whose address was published along with the specification.

G. A.—The mark on one of the prints is manifestly due to the spring, but we cannot understand why it should be there. We are using a single slide with a bright brass spring, but out of many hundred exposures not one has shown any mark. The only thing we can suggest, without seeing the slide, is to put a piece of black paper the size of the plate behind it.

E. J. K.—1. Makers of focal-plane cameras in this country are Messrs. Houghtons, Ltd., 88/89, High Holborn, London, W.C.1; the Thornton-Pickard Manufacturing Company, Ltd., Altrincham; and Messrs. Ross, Ltd., 3, North Side, Clapham Common, London, S.W. 2. Most focal-plane cameras are used by scale focussing only. As a rule the blind has an aperture the full size of the ground glass, and can be set open at this aperture to allow of focussing in the usual way.

C. J. K.—There are half-a-dozen different models of printing boxes which are very suitable for running off from a dozen to 100 or 200 bromide cards. As we suppose, you would want to work by oil-light, about the best pattern is the Hana, made by Messrs. Houghtons, Ltd., 88-89, High Holborn, London, W.C.1. Most of the others are designed for use with electric light, although oil can be used by inserting a reflector. In the Hana, however, the negative is supported vertically; you thus get direct illumination when using an oil lamp.

N. T. E. L.—The examples are very good, but, candidly, we do not think there is a market for the apparatus. The idea is a very old one, and from time to time attachments for the camera in the shape of a sliding shutter or a series of two shutters, fitted in some cases in front of the lens and in others a short distance in front of the plate, have been placed on the market. You will not be far wrong in assuming that the people who want to take these double and treble portraits are sufficiently interested in them to make the apparatus for themselves.

W. J. A.—1. Yes, certainly you cannot do any dodging, except to a very limited extent by shading the negative. 2. There will be a little loss of sulphurous acid, but nothing material. 3. Increase

of hydrochloric acid causes decrease of density. 4. The granular appearance of the face is exaggerated grain of the paper in making the copy negative. You should not get this effect in direct portrait negatives, although you get something like it, due to the reproduction of the texture of the skin, when an ordinary plate is used. An orthochromatic plate used with a light-filter, such as a K2, will largely remove it.

F. W. H.—There is no firm which specialises in the transposition of stereo negatives, and none in the supply of requisites for stereoscopic work. The catalogues of Messrs. W. Butcher and Sons, Ltd., Camera House, Farringdon Avenue, London, E.C.; or Messrs. Houghtons, Ltd., 88/89, High Holborn, London, W.C.2, show as full a range of stereoscopic goods as any other firms. As regards the cutting and transposition, the best advice we can give you is to apply to the secretary of the Stereoscopic Society, Mr. A. T. Mole, 39, Westbere Road, West Hampstead, N.W.2, who, we feel pretty sure, could recommend to you from among the members someone to whom you could safely entrust such work.

L. T. H.—One formula for this combined developer and fixer is as follows:—

Soda sulphite, cryst.	31 parts
Hypo	248 parts
Soda carbonate, cryst	8 parts
Potass. bromide	8 parts
Water	800 parts
Hydroquinone	20 parts
Ammonia (sp. gr. .91)	45 parts

Another very similar one is:—

Water, to make	40 ozs. fluid
Hydroquinone	½ oz.
Soda sulphite	4 ozs.
Soda carbonate	4 ozs.
Hypo.	8 ozs.
Liq. ammonia .880	2 fl. ozs.

The plates are developed (and partly fixed at the same time) for two to three minutes, according to the temperature, and are then examined in daylight and fixed in plain hypo. More ammonia added to the developer gives more vigour, if required.

N. R.—When you exclude portrait photography you cut out what is the most professional branch of photography. When one comes to the others, they are frankly commercial, and therefore, perhaps—so we judge from your letter—not so likely to be congenial to you. Probably the most promising branch at the present time is that known as "commercial photography," consisting of the photography of all kinds of articles of manufacture, engineering works, specimens in museums, paintings, and so on. It is a branch of work which needs a good technical training, but with a year at a school such as the Manchester College of Technology or the Photographic School of the Regent Street Polytechnic, you will get a good grounding, which would qualify you to begin business on your own in a small way, or to get a post as an assistant with a firm of commercial photographers. But, generally, the prospects of obtaining employment in photography are very uncertain. A great deal of new labour has come into the business during the war, and is likely to stay there, with the result that, as demobilisation has gone on, the labour supply has been considerably greater than the demand, and, we think, is likely to be for several years. If you have any real artistic ability and aptitude for portraiture, this latter is really the best branch which you can think of taking up, since you could start a small business with comparatively little capital, and with a reasonable chance of making a decent living.

R. S. (New Zealand).—We have no makers of soft-focus lenses in this country other than those of the portrait lenses of Cooke (Taylor, Taylor, and Hobson, Ltd.) and Dallmeyer, fitted with adjustments for soft focus, and the Bergheim lens. Even so, the portrait lenses give a comparatively moderate amount of diffusion of focus. All the lenses designed and sold specially for soft-focus effects are made in the United States. We give you the names of some makers taken from an "Almanac" of about ten years ago. Very likely there have been changes since then:—

Gundlach Manhattan Company (the Smith lens of about *f*/6), Rochester, New York, U.S.A.

Spencer Lens Company, of Buffalo, U.S.A. (the Portland lens).

There was also the Pinkham and Smith Company, whose address we do not know, which was the first firm to sell a soft-focus lens, which was called the Smith. The only lens of this kind which we have used ourselves is the Verito, of the Wollensak Optical Co., Rochester, New York, U.S.A. It gives a very pleasing, but not excessive, diffusion at full aperture *f*/4, the diffusion being reduced as the lens is stopped down. The 7-in. lens, which covers a half-plate sufficiently well, although it is rather a short focus for this size, requires a flange of 2½ inches internal diameter, 3½ inches external diameter. The diameter of the lens hood is 2 inches and the over-all length of the lens from back to front is 2½ inches.

L. C. M. (Sarawak).—1. In reply to your letter of June 25, which has just come to hand, nothing is better established in connection with the photographic portrait business in this country than that the photographer has the right to the custody of the negative. When a sitter comes to be photographed, and pays in the ordinary way, it is quite true, as you say, that the copyright in the portraits is the sitter's but the right of possession of the negative is the photographer's, and the negative is never handed over to the sitter except by special arrangement and payment of a substantial sum. This right (to the possession of the negative) has been confirmed over and over again in the law courts, and even in one case, heard in the High Court, in which a customer had to pay the photographer specially for certain negatives for the production of a special kind of photograph. In this case, also, it was held that the negatives remained in the photographer's possession. It is quite a mistake to suppose that sitters in England are able to get the negatives in order to have them printed elsewhere. We do not suppose that even special payment is made to obtain possession of the negative in one case out of ten thousand. This matter is fully dealt with in the handbook, "Photographic Copyright," which we can send you post free price 1s. 2d. But in the meantime no doubt this statement will suffice for your purpose. 2. Charges for portraits range from four to five guineas per dozen down to, say, one pound per dozen. At the higher prices it is usual to take a number of positions, say, half-a-dozen, and to allow the sitter to select from these as he prefers in ordering copies at the dozen price. Charges for group photographs are very variable, but by good-class photographers about £1 10s. would be charged for taking a 10 by 12 group and supplying one print from the negative.

The British Journal of Photography.

The Oldest Photographic Journal in the World.

PUBLISHED EVERY FRIDAY. ESTABLISHED 1854. **PRICE TWOPENCE**

TERMS OF SUBSCRIPTION, POST FREE.

UNITED KINGDOM.—One Year, 10s. 10d.; Six Months, 5s. 5d. Three Months, 2s. 9d.

CANADA ... ...
AUSTRALIA ... ...
NEW ZEALAND ... ...
SOUTH AFRICA ... ...
UNITED STATES OF AMERICA
SOUTH AMERICA ... ...
INDIA AND FAR EAST ... ...
CONTINENT OF EUROPE ...

One Year.

Thirteen shillings (13s.), or 3 dollars 17 cents, or 18 francs 50 cents, or 9 rupees 12 annas, or 6 yens 30 sens.

FEDERATED MALAY STATES, BORNEO AND SARAWAK 5 dollars 57 cents.

HENRY GREENWOOD & CO., LTD., Proprietors and Publishers, 24, Wellington Street, London, W.C.2.

IMPORTANT NOTICE TO READERS.—Until further notice agents will supply the "B. J." to order only, as the high price prevailing for everything in connection with newspaper production prohibit the distribution of surplus copies for chance sales. It is therefore necessary in order to ensure the regular delivery of the "B. J." each week to place an order definitely with a dealer, newsagent or bookstall clerk, or to send a subscription to the publishers.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3094. Vol. LXVI. FRIDAY, AUGUST 22, 1919. Price Twopence.

Contents.

	Page
Ex Cathedra	481
The Photographic Section of the Royal Air Force	482
Photo-Micrography Without a Microscope. By G. Ardaseer	483
Night Photography. By Robert Dykes, F.R.P.S.	484
Outdoor and Garden Portraiture. By Charles H. Davis	487
Practicus in the Studio. By *Practicus*	489
As to the Selling Prices of Portrait Photographs	490
Assistants' Notes	491
Photo-Mechanical Notes	491
Forthcoming Exhibitions	492
Patent News	492
Meetings of Societies	494
News and Notes	494
Commercial and Legal Intelligence	494
Answers to Correspondents	495

SUMMARY.

The first instalment of a contribution by Mr. Robert Dykes on night photography underlines the charm of this branch of work, suggests subjects, and proceeds to practical advice on apparatus. (P. 484.)

An article by Mr. G. Ardaseer gives succinct working instruction in photo-micrographic work without a microscope. (P. 423.)

Is there the intention on the part of the Photographic Section of the R.A.F. to waste public money by embarking on a programme of aero-photographic survey? We discuss the question in a leading article on p 482.

Writing on the making of outdoor and garden portraits, in supplement to a recent contribution to the technique of at-home portraiture, Mr. Chas. H. Davis has some strong words of criticism of the "blur, foozle, and falsity" which is passed off as art in this branch of photography. (P. 487.)

The storage—or, rather, filing—of negatives is the subject of this week's article by "Practicus," who describes the methods applicable to different classes of negative. (P. 489.)

Whole-plate, instead of cabinet, as the average minimum size of portrait, is a new policy being adopted by some studios, and is one which offers notable commercial advantages. (P. 482.)

Much sound judgment on the question of the selling prices of photographs is contained in a discussion of this subject by the *Photographic Journal of America*." (P. 490.)

The service of guide negatives and prints in securing a high uniform standard of output is the subject of a contribution to "Assistants' Notes." (P. 491.)

Some recent observations of ours in small towns suggest that business in certain styles of photograph is allowed to pass into other hands. (P. 481.)

View postcards, which should now come into popularity again, need to be benefited by a worthy process of reproduction and by more artistic quality and greater variety in the subjects themselves. (P. 482.)

In the making of photographs for use in advertising certain classes of goods there are evidences of a growing favour of diffused definition, coupled, it should be added, with genuine artistic qualities. (P. 481.)

Mr. Elwin Neame is introducing an invention of his own by which the photograph of any scene is utilised as the background for the sitter. Apparently the invention consists in the optical device for producing the combination negative at the single exposure on the sitter in the studio. (P. 482.)

Tint-laying, light edges in half-tones, stripping in wet collodion are among the topics of "Photo-Mechanical Notes." (P. 491.)

An optical device for the division of light-pencils in duplicating the image of a lens is among the "Patents of the Week." (P. 492.)

EX CATHEDRA.

Sameness. During a recent journey, we have been struck by the monotonous appearance of most of the photographers' showcases in several towns. The work has been in most cases of fairly good quality, but it has almost looked as if there was a "sealed pattern" for specimens. Almost invariably the mounts are brown, and the prints in black or sepia bromide. Little coloured work is shown, and that not of attractive quality. We have also noted the paucity of good enlargements on view. In one town we noticed a show of excellent work, but not including a single enlargement, while a few doors off a stationer was displaying several enlargements at a fair price, considering the very moderate quality. Miniatures either of good or cheap quality are also usually conspicuous by their absence, while stationers and cheap jewellers are pushing them as an accessory to the lockets or pendants they have for sale. It would look as if photographers had not yet learned how to get the best results out of their window displays, for we are sure that in many places it would be possible to add very considerably to their turnover by bringing forward something besides the cabinets and postcards which are shown to the almost total exclusion of other styles.

* * *

Soft-Focus Commercial Photographs. The technical photograph which is made for the purpose of advertising articles of manufacture is so commonly required to be of sharp definition before anything else that a tendency on the part of advertisers to break away from this tradition may easily be overlooked. But the American advertising journal, "Printer's Ink," reminds us that among several large advertisers in the United States there is the deliberate policy to forsake photographic detail for breadth of effect, in other words to employ the soft-focus lens in making photographs which are still photographic in their drawing and tonal values, but get away from the hackneyed type of photographic illustration in their elimination of distracting detail. Clothing is one article which has been treated in this way. Instead of the photograph which makes the hand-drawn fashion-plate its model—one showing every stitch, button and fold—the policy has been to subordinate details to portraying an atmosphere of luxury. A leading advertiser of these goods is thus using a pronouncedly diffused photograph in which a man in evening dress is paying addresses to a well-dressed woman. The underlying suggestion is "that a man who wears this particular brand of clothes is entirely at home in these alluring surroundings, and he, too, may pay court to ladies fair and with a gallantry as to the manner born." The same idea is applied to other goods, to hats, pianos, cigarettes, to articles in short where taste and refinement of choice, rather than mere utilitarian motives, determine purchase. The point

of view is certainly one which must not be overlooked by photographers who cater for advertisers in competition with the artist-designer.

* * *

"Real Photo" Postcards. It is to be regretted that owing to war conditions the genuine bromide postcard views have almost disappeared from the shop-windows of stationers and others at the holiday resorts, and to a lesser extent from those in London. They are replaced by half-tone cards, usually of very inferior quality, even collotype appearing to be too costly in most cases. What is more deplorable is the influx of coloured litho, or three-colour cards of the coarsest type, which show a very decided lowering of the public standard of good taste. We trust that as we approach normal conditions again, we shall see the return of the bromide card, and to that end it is to be hoped that the producers of them will endeavour to raise the artistic as well as the technical standard. Many of the local views are poor in quality of negative, and uninteresting in subject. We need only refer to the views of the Hastings district, produced and issued by Mr. Fred Judge, to show that a very high artistic standard is a commercial proposition. Surely there must be many photographers who could produce really artistic views of their own neighbourhood, which they could easily get printed by the firms which specialise in this class of work.

* * *

Why Cabinets? When the C.D.V. craze had reached its height, photographers were well pleased with the introduction of the cabinet portrait, as it enabled them, with little more labour and only a slight increase in cost, to produce pictures which could be sold for at least double the price obtained for the smaller ones. It would seem as if the time had come for a further step in size, and to our certain knowledge several high-class London photographers are making whole-plate prints their standard line, the receptionist being instructed to show nothing smaller unless it be specially asked for. There is much to be said in favour of this proceeding in localities where it can be introduced. Even at the present price of materials a very substantial increase in profits can be made by an advance of, say, 50 per cent. upon cabinet prices, and very often more than this percentage can be added. If the printing arrangements for bromide or gaslight papers are such that enlargements can be made as easily as contact prints, the plate bill need not be increased, and in the case of platinum and carbon orders the difference in cost between half and whole-plates is not worth considering, as adequate prices should always be obtained for these processes. As far as retouching is concerned, the cost of this for matt surface printing is probably less for whole-plates than it was for half-plate negatives for glossy paper.

* * *

The "Natural" Background. According to a Sunday illustrated paper, Mr. Elwin Neame has devised, and is using, a system of taking portraits, the backgrounds in which are evidently produced in the negative from some scenic photograph which may be of any subject whatever. Thus, two examples of this process show Miss Ivy Close, barelegged and lightly clad, in one case striking an attitude in Bond Street, and in the other ankle-deep in a Manx stream. Such a method of combining the portrait of a sitter at the time of exposure with a background representing any selected scene has attracted inventors as long ago as about 1875, when a system of this kind was patented by Tilley. It was rediscovered in almost the identical form by a Swiss photographer named Dischner, and a somewhat similar device was patented a year or two later by a German of the name of Sontag. If the brief newspaper reports are reliable, Mr. Neame's system must be different from the foregoing for he uses a camera of a size little short of that of a bathing machine in conjunction with artificial illumination of 80,000 c.p. For much of the combination photography which he produces for advertisement purposes such a process, we can understand, is exceedingly useful; but in the sphere of ordinary portraiture we are unable to see that it possesses any real advantages, unless novelty and sensation are counted as such.

THE PHOTOGRAPHIC SECTION OF THE ROYAL AIR FORCE.

It would appear that there is a desire on the part of those associated with the Photographic Section of the Royal Air Force to maintain that branch of the air service upon a considerable footing, and to do so by transforming in a large measure its activities from the military to the civil sphere. Only on such an assumption can we interpret the view expressed at a recent dinner of officers of the Photographic Section of the R.A.F. to the effect that it was hoped the British Air Ministry would appreciate the value of the science (of aerial photography) as soon as possible, and that every town, river, railway and road in this country should be photographed as soon as possible. Such is the opinion which we quoted in our last issue from a brief "Times" report of the social function. It is one which certainly calls for some examination.

Is it suggested that the Air Ministry has not accorded a full measure of recognition to aerial photography? Assuredly, the elaborate organisation of the Photographic Section, including a school of aerial photography at Farnborough, proves that it has—for military purposes. Moreover, the work of the Photographic Section could hardly have been more emphatically endorsed than it was by the military commanders, particularly during the latter period of the war. Press and public, as the result of the various war exhibitions, have also added a chorus of laudation extolling photography in the air, and ranking it high among the instruments of victory. Thus, the Photographic Section may surely be content: it has accomplished a great work with triumphant success, and, in the Service and out of it, has received corresponding recognition as the "eyes of the Army."

But perhaps it is not these now accomplished labours that are in the mind of the Photographic Section when appreciation of the value of the science is craved, but rather the further development of methods of aerial photography, of appliances therefor, and of new applications of aero-photographic methods in warfare. That is a very natural programme, but we cannot see that the suggestion to undertake a wholesale photographic survey of these islands from the air has anything to do with it. The disparity between the two things is so great that one is encouraged to think the association of the one with the other, or the suggestion of the latter as a development of the former, is simply the distortion of a very partial Press report. But as this is a matter which closely concerns those engaged in photography as well as the general public it is necessary to consider, with the object of arriving at a clear judgment of the matter, what are the possibilities involved.

In this connection the view of the Photographic Section seems to be that the war-created "science of aerial photography" should be further developed, and that the Air Ministry should also proceed to apply it to other than military purposes. On both of these propositions something requires to be said. We welcome the first if it means that, except for the now insignificant amount of aerial photography required in the field, the Photographic Section should resolve itself into an experimental depart-

ment equipped to study the mechanical, optical, and photographic requirements of aerial photography for the naval and military services. Such work as this has been done during the war largely on an emergency basis. Very largely, successive developments have been dictated by the circumstances of warfare, and very largely, too, the function of the Photographic Section has been to state its problems, and to leave their specific solution to manufacturers. A picked staff of a score or two under the direction of three or four heads familiar with the conditions of aerial photography, and in close touch with progress in flying and aerial warfare, would easily preserve the Photographic Section in a state of preparedness—a preparedness of ideas and solved problems—which hitherto in its short swiftly progressive history it has never been able to be in for long together. By adopting and forwarding such a policy as this, the Photographic Section will have the twofold satisfaction of gathering and fructifying the experience gained in the war, and of loyally contributing to the reduction of the wasteful expenditure from which the whole country is suffering.

When we consider the proposition that "every town, river, railway, and road in the country ought to be photographed from the air," we cannot avoid a misgiving that such counsels of prudence influence the mind of the Photographic Section. The suggestion implies expenditure in personnel and equipment of the order of that on a war footing, and whereas the work of aerial photography in France and other theatres of war had everything in its justification, there are several very good reasons why this peace programme should not be embarked upon by the R.A.F. until its urgent necessity has been demonstrated. In the first place, it has yet to be shown that aero-photographic survey of so well a surveyed country as England, or even of unsurveyed territory like parts of the African continent, is a sufficient substitute for the proved methods of the topographer, or requires to be used in supplement to these latter. Undoubtedly aero-photographic methods will come into use, and may prove extremely valuable, but they are still in the experimental stage, at which they call not for wholesale application, but for investigation and for comparison, as regards cost, speed and other features, with existing methods. At the present threshold stage of their development it is the easiest thing to carry out an immense amount of quite useless work. A further objection to the adoption of a scheme of this kind by the R.A.F. is that such civilian work is properly left to civilian persons and firms, to be done by them as circumstances show its commercial desirability. It is one of those enterprises that can very well wait for a year or two until its value is clearly established, and nothing is likely to be sacrificed by its elimination from the programme of a great Government spending department. We are prompted to lay more emphasis on this point than we otherwise should by the fact that in the many lists of surplus war material offered for sale by the Government we have hitherto seen no aerial photographic equipment, although we have reason to think that the stocks at the date of the armistice very largely exceeded the requirements of the Photographic Section on a peace basis. The fact may have little significance, or on the other hand, it may signify an attempt to direct the work of the Section into new channels. In view of the defective control over public expenditure at the present time it would perhaps be worth while to ascertain by a question in the House of Commons the number of personnel of all ranks in the Photographic Section now and at the date of the armistice, if recruits are still being admitted, if surplus material is to be disposed of, and if the work of the Section is to be confined in the future solely to photography in its application to warfare.

PHOTO-MICROGRAPHY WITHOUT A MICROSCOPE.

Considerable interest was aroused by the show of photo-micrographic work held during February last at the Camera Club Gallery in John Street, Adelphi. The exhibition showed a few of the innumerable lines on which work by means of microscope and camera is being pursued. Incidentally, some of the remarks of the purely pictorial section of photographers, while not always complimentary, were at least amusing. From the catalogue it appears that the magnifications varied from x 7 to x 3,000 linear dimensions. Now, with low-power work—say, up to x 12—a microscope is not generally necessary, and any photographer who possesses a short-focus lens of about 3-inch focal length, and a camera with long extension, can set about doing quite successful work. The writer uses for such purposes a Voigtlander Collinear of 70 mm. focal length—say, 2 4-5 ins.—and with a triple extension half-plate camera of 23 ins. when fully racked out he gets a magnification of x 7 without any additional extension device. The extensions are readily calculated from the formula $(M + 1) f$ = distance between ground-glass screen and, for convenience, lens diaphragm, where M is the number of desired magnification and f the focal length of the lens.

Consequently for	×4	the extension	should be	14"
,, ,,	×5	,,	,,	16⅘"
,, ,,	×6	,,	,,	19⅕"
,, ,,	×7	,,	,,	22⅖"

Of course, with a lens of shorter focal length, such as an Aldis 2 in., the magnifications will be greater with the same extension.

To rig up the apparatus it is best to have a base-board, along the centre of one side of which a line is ruled lengthways. This simplifies centring the light and the object. The latter is held in some kind of holder, which will allow it to be adjusted to the axial line of the lens, and the illuminant is also adjusted to the same line. The diagram (Fig. 1) will

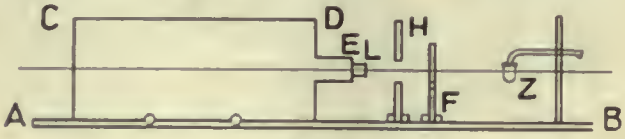


Fig. 1.

indicate what is meant. AB the baseboard, CD the camera, E a tubular extension to fit camera and take lens L, H the slide holder, shown in detail in Fig. 2, and I the illuminant.

Fig. 2.

The tubular extension used by the writer consists of a piece of a stout cardboard tube—originally that in which bromide paper was packed—about 6 ins. in length and 2½ ins. diameter,

and cut off accurately square; one end glued into a wooden camera front-piece and the other end fitted with a wooden disc with central hole to take the lens flange. It is important that the lens axis should be truly horizontal, and care must be taken to keep the disc end square with the tube. The object holder must have a hole about 1½ in. out, but with its centre exactly level with the height of the lens centre above the base board. The holder can be fastened to the base board, or its base may be weighted to give rigidity. The light—the writer uses an inverted incandescent mantle—slides upon a rod on a heavy square base. If runners are attached to the base board, between which the holder and light-standard can slide, matters are made easier in adjusting the illumination. The camera is clamped to the base-board, and the whole arrangement is such that the centre of the focussing screen, the centre of the lens, the hole in the holder, and the light are in one straight line. There is a small ledge, LL (Fig. 2), on the holder on which to rest the slide, and two curved pieces of watch spring, SS, are screwed on to it to maintain the slide in a vertical position.

A pencilled cross is marked on the ground-glass focussing screen at the intersection of its diagonals. The light is centred by focussing it on to the screen and moving it up or down or sideways until the image of the mantle is central with the cross. A piece of cardboard 3 ins. by 1 in., with a small hole in the centre, is placed in the holder, with this hole central to that in the holder, and the same focussing and adjustment of the holder is to be observed. The object—say, a section of wood—is placed in position, focussed first by racking out the front of the camera and a final sharp focussing—seen best through a focussing glass, set to give a sharp image of the pencilled cross on the ground glass—is effected by racking the back of the camera in or out until every detail is sharp. The light is cut off, preferably by interposing a piece of black card against the lens and between it and the object. The dark slide is inserted, the shutter withdrawn, sufficient time allowed to admit of all vibration ceasing, and then the card withdrawn and exposure made. The card is then replaced and the shutter closed. In many cases where the object is coloured a colour filter is almost a necessity, and a small holder for it, somewhat similar to the object holder, can easily be improvised. The filter should be placed close to the object (F in Fig. 1) and between it and the light. For mounted insects—generally of a yellowish colour—a K3 filter is very useful. The Wratten series of M filters, although intended for M panchromatic plates, are almost essential for successful results with other plates.

For opaque objects the light or lights are placed at the side of the camera, but behind the lens, so that no direct light falls into the lens, and sometimes a couple of lengths of magnesium ribbon burned one on each side will give excellent results. In fact, the procedure in this case is similar to that of copying. In a short article minute details cannot be entered upon, but there is one point, exposure, which is most important. Insufficient exposure is fatal to success, and the judicious waste of a few plates, in the sense of two or three strip exposures on one plate, will do much to give an idea of the correct time to expose. This, too, is governed to a large extent by the colour of the object, yellow, red, or brown objects requiring a very long time as compared with white, grey, or blue.

When focussing with the focussing glass it is very convenient to cement one or more microscope cover glasses with Canada balsam to the ground-glass side of the screen, and to focus the aerial image so produced. The writer, however, generally uses a focussing screen of his own make, as described by him in the "B.J." of June 27 last. He feels sure that any photographer who tries this method of low-power work will not stop there, but will desire to have a microscope as well, and wed it to the camera.

G. Ardaseer.

NIGHT PHOTOGRAPHY.

[Perhaps no branch of outdoor photography offers so great a degree of attractiveness as that of outdoor scenes under artificial illumination, particularly to those in large cities where an abundance of subjects of this kind is available. Since the immediately forthcoming season is the best time of year for night photography we take the opportunity of publishing a comprehensive practical article on the subject by an expert in it of long experience, Mr. Robert Dykes, F.R.P.S., formerly senior scientific assistant to the late Sir John Murray, K.C.B., F.R.S., and of the North Sea Fishery Investigations. Part of these notes appeared in a manual on night photography by Mr. Dykes, issued some years ago by Messrs. Dawbarn and Ward, but long out of print. In embodying them in his article Mr. Dykes has revised them, and has added one or two examples of his work, the reproductions of which on the paper and rate of production necessary for the "B.J." cannot, unfortunately, do anything like justice to the quality of the originals. In a succeeding instalment of this article Mr. Dykes will describe a method of introducing night and interior subjects into cinematograph films.—Ed. "B.J."]

Exposures at night have now almost reached the snapshot stage, thanks to the rapid strides made in the production of fast colour-sensitive plates. What the future holds in store for us as regards quick exposures depends very much upon the skill of the lens and plate makers.

It is held by some photographers that night photography has few pictorial possibilities. To a certain extent this is so, for of the thousand-and-one subjects by day we have perhaps only one that may be suitable by night. Then, again, night work does not permit of the drastic treatment evidently meted out to some of the daylight productions seen at exhibitions. The lighting is so different, high-lights and shadow being much more difficult to handle. One cannot take this or that out and put something else in place very easily, because the slightest sign of faking is distinctly noticeable upon the negative. What one aims at in pure "nightscapes" is a clean, correctly exposed and properly developed negative, with the shadows almost clear glass but full of detail, and the high-lights moderately dense, but free from any pronounced halation. Such a negative can be printed by contact, or enlarged, and, according to the process employed, the detail subdued if desirable.

Granted that night work has few pictorial possibilities, it yet has a charm all its own. Photographing in a large city at night, for it is largely city scapes we draw upon, we see it in quite a different light. What is a busy, noisy, uninteresting street during the day is now quiet, almost deserted, with fine clumps of heavy dark shadows emphasised here and there where a street lamp throws its reflection over the pavement. Think of Whistler striding around Chelsea after dark on a nocturnal prowl, noting and memorising one of his beautiful nocturnes in black and gold. Who that has any feeling of romance or sense of the artistic would ignore the majestic and impressive grandeur of St. Paul's Cathedral looming up

out of the darkness as we walk up Ludgate Hill on a wet night, or the quiet of the Thames Embankment near Cleopatra's Needle on a foggy night, the stillness only broken by the hoots of river craft or of stray taxis. This is London wrapt in darkness as London or any city should be seen; for during the day, when its streets are throbbing with life and roaring with noise, the mind gets very little opportunity of appreciating the mystery and vastness of a great city. How many of us have often felt the desire to have a photographic record of some such scene? Or perhaps Trafalgar Square on a wet night, with its sparkling lights and brilliant reflections.

If darkness were absolute by night, photography might be out of the question except by flashlight, about which it is not

Stockholm from the Royal Palace. By Robert Dykes, F.R.P.S.
(This and other examples of Mr. Dykes's work in night photography are reproduced by courtesy of Mr. A. H. Pratt, of "Country Life.")

my intention to speak, but all the year round there is no time of the night perfectly dark from a photographic point of view. There is always a certain amount of light even out in the open country away from all apparent life, with no sign of an artificial light. I do not think that on the darkest of nights—once our eyes become accustomed to it—can we feel absolute blackness. The hedges and trees by the roadside loom up from the darkness of shadow to the darkness of an inky sky, yet they are discernible. Now, if the eye can discern objects at night, it is obvious that the more sensitive lens and photographic plate will do so, and at the same time pick up and record many things the eye could not see. If objects are discernible in the open country at night, how much more so must they be even on a very dark night in the city, where lights from thousands of different sources brighten the darkness and are reflected back from the clouds, giving a diffused light of great value for picking up detail in the shadows. Then, again, on a clear night, with a full or half-moon, we have a wealth of white light that is so highly actinic that even in December it is easy to over-expose and get a daylight effect.

Night photography is dependent, then, upon the amount of actinic light available at night, and this may be, roughly speaking, only 1/25,000 part of that obtainable at mid-day for an open city view. In other words, 1/25 of a second with $f/11$ would become fifteen minutes with the same stop at midnight. But the pictorial aspect of the work lies not in the direction of light, but in the proper handling of the shadows; it is the soft, mysterious, suggestive shadows, set off by a little light here and there, that appeal to the imagination. Night becomes a model which we may pose as our fancy pleases and our sense of poetic imagination allows. Shrouded in her wonderful shadow draperies, she becomes a dream of suggestion to the artistic mind, and, according to our mood, so may we portray our feelings. To take pictures at night does not necessarily mean taking photographic records of long processions of street lamps. The great charm of pictorial night work lies in getting that Whistlerian atmosphere and breadth of effect, the correct rendering of large masses of shadow, with simple suggestion of line and subdued detail, and no pronounced glare of light; in fact, to endeavour to hit that soft charm and bewitching mystery that Whistler mastered, where detail was only apparent when you were not looking for it, and when you did it seemed to vanish into tonal masses of shadow.

The earliest exhibited night photograph was one of the Houses of Parliament at night, by Mr. W. M. Edmonds, in 1895, followed by Mr. Paul Martin in 1896 and 1897. Since that time some excellent work has been turned out by many workers in different parts of the world. Perhaps the most notable advance made in night photography was by Mr. Wild in his snap-shots reproduced in "Photography," in 1909, when, with an $f/3.3$ lens and panchromatic plates, he succeeded in taking night pictures with life at exposures of about a quarter of a second in the West End of London.

Street photography is perhaps the most fascinating form of night work. Little bits of street corners with a church steeple or a statue sharply silhouetted against the sky or some high-lights make very nice pictures. The exposure will vary from half an hour for a close view with few lights to fifteen minutes for an open view such as a large square, using $f/11$ and a rapid plate.

In wet weather the streets in places look their best; the lights scintillate bright and clear out of the darkness, and cast their reflections over the pavements. Under such conditions five minutes may be knocked off the above exposure.

Some churches when lighted up at night afford very pretty pictures, especially if the stained-glass windows are well illuminated. This class of subject is one for which I would recommend the use of rapid orthochromatic plates. With an aperture of $f/11$ give an exposure of thirty to forty minutes.

Myrdal in the Bergen Mountains. By Robert Dykes, F.R.P.S.

In most classes of night photography I much prefer ordinary rapid plates, as I have found that instead of orthochromatic plates being quicker at night they are, if anything, slower. Most of the lighting at night is yellow, and the shadows are very frequently blue. For this reason the ortho plate picks up and overcomes the high-lights before the shadows get a look in. In night photography we may consider that the high-lights are always considerably over-exposed and the shadows very much under-exposed. Then, again, they have to undergo such prolonged development that there is every risk of either chemical fog or light fog taking place.

Shipping always lends itself to pictorial treatment, and on a fine clear night very good pictures may be obtained. Care must be taken to avoid movement either by rising or falling

tides, or by wind. The most imperceptible rock or sway of a ship's mast will spoil the photograph. Exposures are much the same as for street work—i.e., a rapid plate, well backed, *f*/11, fifteen minutes or so.

Some particularly beautiful skies are to be seen at night during the summer, and using *f*/8, a rapid plate, not necessarily backed, one can get a negative with three minutes' exposure, providing that the clouds are not moving too rapidly.

With a full bright moon exposures at night are not so lengthy, and an open view, such as a large city square, may be taken in six or seven minutes, using *f*/11 and a well backed rapid plate. An open view in the country free from artificial

Stockholm from the Katarina Hissin. By Robert Dykes, F.R.P.S.

lighting under similar circumstances will take half an hour to three-quarters. It is of no use attempting country work unless by moonlight, but bits of road with clumps of trees and perhaps a thatched cottage help to build up very pretty little views.

Care must be taken not to include the moon, or the result will be a long elliptical-shaped mark across the sky as a result of movement.

I may state with tolerable accuracy that all night photographs that include a moon are faked. The method of their production is to snapshot against the sun and to develop the negative up thin; artificial lights are then put in with the brush. Certainly these faked night pictures are very pretty, but they depend greatly upon cloud effects; and the artificial sources of illumination put in with the brush give a false and very feeble idea of light and shadow.

Mr. C. Heyl devised a means of including a real moon in the photograph simply by making an exposure on the moon and then capping the lens and waiting until it had moved out of the view, when the exposure was continued. Perhaps this is the best method of putting a moon into the view. I must warn intending "moonlighters" against over-exposure. One has a considerable amount of latitude in night work, but never give more than twenty minutes on a well-lighted street scene, with full moon, a rapid plate, and *f*/11. Five or ten minutes more than this, and no matter how carefully you develop your plate, the result is a *daylight* effect.

Illuminations, perhaps, are the first class of subject that tempts the amateur photographer to try his hand at night work. As with firework displays, the difficulty is to get a place free from the crowd. Illuminated buildings such as one sees at exhibitions make fairly good photographs, but there is too much symmetry, too much design, to make them really pictorial. A common mistake in photographing illuminations is to under-expose. One does not care to see simply rows upon rows of fairy lamps with almost nothing to support them, not even fairies. Using a rapid plate, backed, and *f*/11, an exposure of at least twenty minutes should be given. Each little lamp is really not very actinic, and, taken individually, would not have much effect upon the photographic plate.

As regards apparatus, nothing special is required. Night photographs may be taken with the diminutive "Brownie," or the large 15 x 12 field camera. A great deal is to be said for the fixed-focus camera in this class of work, as it saves considerable trouble in focussing; but a full-sized view finder is necessary, otherwise an objectionable light that it is desired to cut out will in all probability be left in. In stand cameras the best form is undoubtedly a square bellows with an extensive rising front. If a conical bellows is used it must have loops to prevent cutting off the light. It is a decided advantage to have the lens carried on a panel, as it enables the front to be removed if necessary for stopping down after focussing when the *f* numbers cannot very well be seen. This panel should be easily removed, but quite firm when put in place again. A fine ground-glass screen is an absolute necessity in night photography, and a focussing magnifier cannot be dispensed with. Grease spots are of very little use for focussing, as one never knows exactly where the magnifier is likely to be applied on the screen.

What one really requires in night work, providing one has a camera and lens at all, is a rigid, steady tripod and the camera perfectly levelled, and last, but not least, a good stock of patience and confidence in one's self. You need it, especially in crowded places where the plaintive wail of "Please to take ma photy" or other choice remarks are hurled at you. If there is a strong wind blowing it is impossible to do anything, and it is better, if one cannot get a sheltered position, to abandon the attempt. I have walked six or seven miles to get a certain view, and then had to give it up owing to wind; so that even on the quietest of nights one must feel that the tripod is well

How a night negative should look when developed. By Robert Dykes, F.R.P.S.

set and free from vibrations. As to levelling, the levels should be placed where one can see them easily, no matter at what height they may be, and for that purpose there is nothing to beat Taylor, Taylor and Hobsons' single tube levels with the small side slit. I use one at the top of my swing-back for horizontal levelling, and one at the bottom placed at the side for vertical levelling. No matter how far above my head they may be, I can see the bubble cross the slit.

A light is essential. I use wax vestas, a piece of candle, or, if cycling, my cycle lamp; but to be absolutely "all there" as regards equipment an electric torch comes in very handy. Care should be taken in levelling, or distorted, intoxicated-looking lamp-posts or buildings will be the result.

"Flare" or "ghost images," through internal reflections in the lens, are in many cases caused by extraneous light entering the lens on the right or left from too closely adjacent lamps. To prevent this a lens-hood is useful. A cardboard box measuring about 4 inches deep by 6 inches wide, with a hole in the bottom sufficiently large to allow of its being slipped over the lens firmly in case of wind vibration, top outwards, answers the purpose admirably.

When working in wet weather or taking lightning flashes where there is a risk of getting the camera wet, a waterproof cover is necessary. Care must be taken to keep rain or mist off the front of the lens; it may be wiped, but *not smeared*, with a soft rag kept for that purpose, even during the exposure, providing precautions are taken not to move the camera in any way. On a cold night the lens should not be handled too much, or condensation of moisture may take place between the front and back combinations.

I have emphasised the importance of the camera being perfectly steady during exposure, therefore it is hardly necessary to warn photographers to avoid bridges where there is fear of vibration through traffic.

Coming now to the "eye" of the camera, for the camera without a lens is like the man without his sight. The better the lens, it may be supposed, the better the picture, but the cheapest of lenses nowadays gives remarkably fine photographs; and except for the fact that to obtain a sharp negative it is necessary to stop down and so increase the exposure, any lens will suffice.

Whatever may be the lens used, the aperture most suitable for work, in my opinion, is *f* 11, and in some cases even *f* 16, so that with a lens having a full aperture of about *f*/7 we can increase the depth, make sure of our focus, and increase the sharpness of our high-lights by putting in a couple of stops. Of course, if it is possible to use an *f*/3.5 or *f*/4.5 lens and a panchromatic plate the lens need not be stopped down and exposures of seconds, or fractions of seconds, made that enable the picture-maker to obtain that suggestion of life which the man with an *f*/8 lens cannot get except by posing his life subjects.

The lights must have a little halation to give atmospheric effect, but too much is objectionable, and may be considerably prevented by stopping down unless very rapid exposures are being attempted.

Focussing should always be done with the full aperture of the lens and the stop adjusted afterwards. Artificial lights in the middle distance will generally be found the most convenient objects to focus upon, and these should appear as sharp-rayed stars and not simply as white circles free from rays. The effect of improperly focussed lights is to have a series of beautiful big black circles upon the negatives which print out about the size of half-crowns.

All exposures should be made with the cap, as it may be necessary to put it on and off during the exposure, and a shutter is not easily opened or shut without jarring the camera. Care should be taken to see that the lens is firmly fixed, and not likely to fall out of the camera front. Many of these remarks may sound absurd, but experience teaches fools, and the unexpected may happen even to the most cautious worker.

ROBERT DYKES, F.R.P.S.

(*To be Continued.*)

OUTDOOR AND GARDEN PORTRAITURE.

[In a further contribution to "The Photographic Journal of America," Mr. Charles H. Davis has set forth his views on his own practice of portraiture in gardens and other out-of-door surroundings. While the technical conditions are altogether different from those within sitters' homes, Mr. Davis is a firm believer in the commercial and artistic future of both branches of work. We commend what he now says to the notice of those who read his article which appeared last week.—Eds. "B.J."]

In making portraits in the open—in gardens or elsewhere—the photographer endowed with an artistic temperament and aspirations has the opportunity of his heart's desire. Practically every sort of a background, environment and lighting is possible. It requires only patience and the ability to see, select and record. The subject may be so placed as to get perfect relief, roundness, and good modelling, and added to these virtues we may produce delightful gradations of light and shade and delicate detail. These attributes of true pictorial portraiture are not to be lightly passed over as unessential, as some self-styled pictorialists would have us believe.

The marvellous possibilities of open air work are being demonstrated daily and nightly at the moving-picture exhibitions. They offer great opportunities for photographic study. For instance, in the charming presentation of "Rebecca of Sunnybrook Farm" there are many beautifully lighted scenes; in fact, unusual pictures may be constantly observed in the higher-class films. The magic of the *contre lumiere*, and the shadow lighting, is made such a feature that one is constantly impressed with the beauty of this most flattering of all lights. It adds an ethereal quality and a poetic witchery that is always a delight to the eye and especially to the gentler sex. In recording light or blonde hair this style of lighting is almost imperative. The more brilliant the light the longer the exposure must be to get into the black shadows. Interesting sunshine lightings may also be observed and studied in the "movies." Time was when sunshine pictures were dead black-and-white; but the clever camera men have discovered the right exposure and development, so that now there are few more beautiful effects to be seen than those made in the California sunshine, which seems unsurpassed for actinic quality and bright illumination. These odd and unusual effects that are never made in studios are the very things most sought after by appreciative people, and are not only more beautiful than commonplace lightings, but do much to render one's work distinctive, and tend decidedly to enhance the photographer's reputation. Such results are, moreover, delightfully picturesque, and place the successful makers quite in a class by themselves.

Much good out-of-door portraiture can be produced on overcast days. The sky is curtained by clouds, and locations are readily found in gardens or near buildings or walls, where the light from the sky on one side is unobstructed and the other side more subdued. This will give almost a skylight effect at times. Under the edge of a tree is a very successful place to work, and porches are quite ideal for head or figure poses. A spot near the end of the porch admitting light from two sides often gives a charming effect, and if a head picture is to be made the wall of the house—out of focus—makes an agreeable background. In gardens where there is a vista with somewhat distant trees we find most delightful arrangements. I make many pictures on dull days and with a certainty of success. Then all shadows are soft, and this condition is perfect for lined and wrinkled faces. These soft out-of-door lights obviate a great deal of the retouching sometimes demanded by sitters of this character.

Another very desirable spot for a portrait is alongside of a high hedge or shrubbery.

On the lawns surrounding country houses are to be found many large trees, the trunks of which form very attractive backgrounds. If a vista occurs at one side a pleasing composition of tree, figure, and vista is frequently possible. A group of two, apparently engaged in conversation, on a pathway, is another pleasing effect, always meeting with the approbation of the clients, and affording a picturesque arrangement with a suitable background. In fact, the possibilitie of lawns with shrubs and trees and little vistas are almost limitless. A group on a bench under a large tree is easily managed, and can be most attractively lighted. All of these out-of-door arrangements may be made with very brief exposures, even on dull days, and they are a winning department of home portraiture.

When we look toward the sun or any brilliant light, we instinctively shade our eyes with the hand so that we may see clearly. For this reason a lens shade or hood is an indispensable part of a photographer's equipment. Light not coming from the picture area is not wanted in the lens; it produces fog, or semi-light-struck plates. Perfect definition and clarity of results cannot absolutely be attained without a hooded lens. The lens may be shaded by various makeshifts, and many times with disastrous results to the corners of the plate, but an adjustable hood is the most convenient and serviceable. I use one of my own construction, designed on the "lazy tongs" principle. It is made of strips of 1-16 in. x ¼ in. brass, riveted loosely at the joints, to permit freedom of movement in adjusting its length. The free legs at the back are curved to lie harmlessly against the camera, and the top is simply hooked on to the camera front. The whole contrivance is covered with black velvet and has a small set-screw for fastening the extension. In working against the light the hood is pulled out enough to cut off all top and side light up to the picture limit, and the degree of extension fastened with a set-screw.

Regarding pictorial photographs, I wish to say that the use of a soft-focus or diffusing lens will not in itself give a pictorial quality. This fact seems to be overlooked by many self-styled "pictorialists." The fundamentals of good composition, balance of light and shade, and lines of beauty must always constitute the agreeable attributes of any pleasing picture. All an imperfect lens can do is to suppress detail, and it must not be imagined in suppressing detail that pictorial quality is the automatic and inevitable result. On the contrary, the loss of detail frequently enables one to see more clearly how very little some "pictorialists" know about drawing and composition. The masses are made more solid by lack of detail, and often there is nothing to mitigate the bald imperfection of the result. Where hands are prominently shown on a near solid background of monotone, black or nearly so, the claw-like effect produced by the repetition of lines in the fingers becomes quite startling and repellent. Gracefully posed hands with changing and confluent lines in the fingers would be attractive in this treatment, but never otherwise. At the last Pittsburgh Salon I noted in particular a picture displaying these faults, and also another of an old lady with a cloak covering all but her head and three fingers of one hand. These fingers were without grace—just three stiff fingers, about as much alike as three bananas on their stem, and arranged much the same. The cloak showed a decided lack of lines of grace, and the face exhibited none of the attributes of good portraiture. As reproduced in the current periodicals the whole effect was smudgy, stiff and quite lacking a lovely pictorial quality. How can anyone think that such a result is pictorially interesting?

This brings me to another point: Why does the amateur believe, because he has a magical means of recording his work, that he can compete with artists who have spent years of study, under the guidance of acknowledged masters, before they venture to place their work on exhibition? Some of our self-styled pictorialists seem to think that they can jump full-fledged into the arena, and they actually do offer to the public, at exhibitions, all sorts of ill-considered efforts, and because they have used a soft-focus lens they serenely and triumphantly believe they are achieving masterpieces. Negatives are habitually undertimed and underdeveloped, yielding prints that have the slightest possible scale of gradations, some being in such a low key that they possess no lights whatever. These prints are in some cases so dark throughout that when under glass they mirror the features of the observer, instead of revealing an interesting work of art. This is a very poor substitute for a portrait of real pictorial photography. It is, in fact, pictorial piffle, and the authors might justly be called pictorial philanderers coquetting with art.

I am not decrying the use of soft-focus lenses or condemning novel or individual effects when they do not violate all the accepted canons of art. I am trying to impress upon the reader the necessity for more art knowledge, with the aid of which he may be able to produce artistic and genuine pictorial results. I have seen many charming, even beautiful, pictures made by the use of uncorrected lenses. I have seen better, however, made by the pinhole and by diffusion printing from sharp negatives. Every now and again, out of the fog and disappointment of blur and foozle and falsity, emerges a real picture. I know from my own experience that these results may be achieved, but not regularly and with certainty. They are the result of a happy combination of fortuitous circumstances with everything working together for good. It needs skill and knowledge to produce pictures. I should say that the first essential would be the ability to make technically good negatives, with fully corrected lenses, embodying also good composition and irreproachable (or nearly so) drawing and lines. When this is achieved, the soft-focus variations may be begun with a certainty of occasionally producing beautiful results—provided always that wooziness is not overdone.

The pianist learns to play scales with freedom and faultless execution; this is, in fact, as everyone knows, the foundation of good piano technique. The photographer, likewise, must first of all, I assert, become a good technician before he can achieve interesting pictures. I grant you that technique is not interesting pictorially. It *must* be supplemented by other desirable essentials. Another thing: belonging to a mutual admiration society, such as some of the organisations seem to be, is not a certificate of pictorial prowess—it is, judging by the results shown, more of a demonstration of intrepidity. Some of the Salon pictures that have been awarded a place by kindred spirits prove this conclusively. Even at our professional conventions there is evidence of mutual aberration of the same kind. No matter where the fog leads there seem to be some who will venture to applaud and follow, though I am sure they could not give a satisfactory reason therefor. The futurist painter is a bug by himself. He sees red water, green skies and variegated people; but the properly made Autochrome shows no trace of these things in Nature. What a blow the Autochrome must be to such a painter! Let us beware of perverted photographic vision, and likewise let us endeavour to make good pictures that need no faking and apologies.

CHARLES H. DAVIS.

STOLEN SIBYL CAMERA.—Messrs. Newman and Guardia ask us to mention that a "Baby" roll-film Sibyl camera, No. 683, fitted with *f*/4.5 Cooke lens, No. 66775, has been stolen from their premises, 17/18, Rathbone Place, London, W.

PRACTICUS IN THE STUDIO.

[Previous articles of this series, in which the aim of the writer is to communicate items of a long experience in studio portraiture, have appeared weekly since the beginning of the present year. It is not thought possible to continue the series to the length of that by the same writer which ran through the "British Journal" some years ago, but if any reader among the younger generation of photographers, and particularly those engaged as assistants, has a particular subject which might be dealt with, his or her suggestion will be welcomed. The subjects of the previous articles of the series have been as follows:—

A Talk About Lighting (Jan. 3).
The Camera and the Lens (Jan. 10).
Managing the Sitter (Jan. 17).
Backgrounds (Jan. 24).
Studio Exposures (Jan. 31).
Artificial Lighting (Feb. 7).
Printing Processes for Portraiture (Feb. 14).
Studio Accessories and Furniture (Feb. 21).
The Surroundings of the Studio (Feb. 28).
Studio Heating and Ventilation (March 7).
The Postcard Studio (March 14).
The Printing-Room (March 21).
About the Reception Room (March 28).
Home Portraiture (April 4).
Portable Studios (April 11).
Copying (April 18).
Handling the Studio Camera (April 25).
More About Lenses (May 2).
Enlargements (May 9).
Advertising the Studio (May 16).
Mounts and Mounting (May 23).
Business Methods (May 30).
Photographing Children (June 6).
Portraits of Elderly People (June 13).
Something about Lenses (June 20).
Hand Cameras for Professionals (June 27).
The Dark-Room and Its Fittings (July 4).
Plates and Their Work (July 11).
Apparatus Repairs and Renovations (July 18).
Posing the Head (July 25).
Intensifying Portrait Negatives (Aug. 1).
Workshop Jobs (August 8).
The Personal Factor (Aug. 15).

THE KEEPING OF NEGATIVES.

Except in some "while-you-wait" studios, where there is no pretence of preserving negatives, no business is too small to be able to dispense with a system of registering and storing negatives. The method adopted must necessarily be suited to the class of work done, that suitable for portraiture being different from that required for view negatives, and from that for commercial work. Two principal objects have to be borne in mind. The first is, the ready accessibility of any particular plate, and the second the protection of the film from deterioration.

I assume that everyone starts by giving the negatives a fair chance of permanency in the way of thorough fixing. If not, the most careful precautions will be unavailing. If a negative be imperfectly fixed, yellow patches will, after a time, appear where silver has been left on the film, while insufficient washing makes itself evident by a powdery appearance on the surface, sometimes even a fine crystallisation being present. In less aggravated cases the presence of a trace of hypo will cause a general yellowing of the image with a considerable loss of density. Even a perfectly fixed and washed negative is by no means permanent unless protected from damp and fumes, and there is no means of doing this effectively except by varnishing. When we remember that a silver coin or spoon will quickly tarnish in a town atmosphere we cannot expect the fine particles which form a photographic image to be less susceptible to change. This is forcibly illustrated by the uneven bloom which is often seen when negatives of various sizes have been roughly stacked together—say a quarter-plate next to a half-plate or other larger size—or where a negative has been treated with retouching medium in patches, the parts protected by the medium retain their original density and colour, while the rest of the image has become decidedly tarnished. It is therefore desirable to protect each negative by placing it in a bag or envelope, which not only keeps it from the atmosphere, but prevents scratching or rubbing during the necessary handling. There are two varieties of negative bag. One sort is made of thin manilla paper, and the other of a coarse transparent paper which allows of the subject being seen without removing the negative from its cover. I much prefer the manilla kind, as it is stronger, and also easier to write upon. The transparent ones are more easily torn both in inserting the negatives and in returning them to their positions in the racks, and this I consider more than balances the slight advantage of transparency. The bags should be made with the *smooth* side of the paper on the *inside*—i.e., the reverse way of that adopted for ordinary letter envelopes.

The register number and sitter's name, which are, of course, already written upon the edge of the negative, are copied on to the bag, preferably at the top edge, so that it can easily be seen when turning over a number of negatives, while any notes or printing instructions may be written lower down, leaving a space of one inch between for the sake of clearness. In arranging the racks or shelves care must be taken to have them sufficiently strong, for closely packed negatives are very heavy in the mass, and will break down brackets or cleats which would support books or similar articles to the same bulk quite safely. The shelves should be made to give sufficient head-room to allow of a bunch of negatives being tilted upon one corner for the purpose of removal. Eight and a-half inches will be sufficient with half-plates, and the edges of the plates should not quite touch the wall or partition at the back of the shelf. This obviates risk of injury from damp and facilitates handling. As a general rule it is well to stack portrait negatives in the order of their register numbers, but not to mix different sizes in one rack. If the same order comprises, say cabinets and 12 x 10, a reference should be made upon the half-plate envelopes to the fact that missing numbers are to be found in the 12 x 10 rack, and a similar reference to the half-plates should be put upon the larger envelopes.

In some small businesses it is attempted to keep the negatives in ordinary plate boxes, with the customers' names outside. This is an inconvenient way, as a boxful has to be handled to find a single negative, and, moreover, when this system becomes outgrown every negative has to be numbered and an envelope provided and written. Even if there are only four or five thousand plates to handle this is rather a formidable job.

Publication negatives, either of views or portraits, are, in my opinion, best stored in card boxes, on the end of which is placed a label giving the necessary information as to the name of place or sitter and the negative numbers. With this class of work it is usual to be provided with a complete set of rough prints, either pasted in a book or kept in envelopes, each print being numbered. Having selected the desired subject, it is a simple matter to go to the rack where the boxes are arranged

in alphabetical order, and to take out "Love, Miss Mabel, 10,987," or "Dover Castle, 8,896," as the case may be. For negatives larger than half-plate I have found a system of vertical filing in boxes very useful. The negatives are put into bags, with a flap at one end about an inch wide. These are stood on end in a box just large enough to hold them conveniently. A sloping block or guide is put at the further end of the box, so that the negatives are slightly tilted away from the front. Names and numbers are written on the flaps of the bags, and these can be turned over like the leaves of a book till the required subject is reached. This is somewhat similar to Houghton's "Negasys" arrangement, but as some of my boxes go back to 1884 I cannot be accused of plagiarism. This system is also very suitable for film negatives, which are likely to be creased if stacked on shelves. Moreover, if the boxes are made of tin, with well-fitting lids, the risk of loss by fire is greatly reduced.

As it is difficult to insure valuable negatives for an adequate sum, it is a good plan to make transparencies of any special subjects, and to store these in another building, so that if the originals are burned or damaged by water it is easy to produce duplicate negatives, almost if not quite, equal in quality. One, at least, of the largest view publishing firms adopted this course with nearly all their subjects, and although I do not think they were ever called upon to use the whole series, the outlay was justified by the ease with which negatives, broken in the ordinary course of printing, could be replaced.

When it is impossible to duplicate a broken negative in this way it should be repaired as soon as possible before the broken edges have got chipped or damaged. I am no believer in the methods sometimes recommended of stripping films and transferring to new glass, or of cementing broken pieces together with Canada balsam, for the simple reason that few people have the skill to do it. In most cases it will be found sufficient to bind the broken parts on to a clean glass with passe-partout or lantern-slide binding, and to print upon a turntable. When large numbers are required the best plan is to make a transparency in this way, to retouch out all traces of the crack, and from that make a new negative. As an alternative a glossy bromide enlargement may be made, carefully spotted and copied in the usual way. Enlargements made for this purpose should be full of detail and rather flat as regards contrast. This can easily be obtained in the copying, and the heavy shadows so often seen in such copies will be absent.

It is a good plan, worthy of adoption by those who rely upon their rejected proofs for specimens to keep a classified index of suitable negatives, so that if it be desired to make a show, say, of children from one to two years old, the pick of the subjects in this class is available in a few minutes. This index must be kept up day by day as good subjects turn up, but the labour of doing this is very small compared with that of hunting through the negatives themselves.

Finally, the best system is useless if not properly followed out. A perfect filing system with, say, five hundred negatives not returned to their places is little better than no system at all.

PRACTICUS.

A DOVERCOURT CHANGE.—The photographic and art-dealing business of Mr. F. G. Steggles, of Dovercourt, has now been amalgamated with the large general and furnishing stores carried on by Messrs. J. A. Saunders, Ltd., of that town, of which business Mr. Steggles joins the board of directors, and, at the same time, remains in charge of the photographic department, which will still be carried on at No. 105, High Street, Dovercourt, where extensive alterations and improvements are being effected and a new studio being built, from the designs of Mr. Drinkwater Butt, F.R.P.S., the well-known photographic architect and photographer.

AS TO THE SELLING PRICES OF PORTRAIT PHOTOGRAPHS.

THE following is an American editorial view, that of the "Photographic Journal of America," on the question which lies at the root of every photographic business :—

What shall be the selling price of his photographs? is the most important question the professional is called upon to answer to-day. Various issues are raised, and so many considerations have to be met and settled that a right or wrong decision is vital in determining the success or non-success of a business. Should the prices fixed upon be too high, competitors will step in and seriously lower the demand for the higher-priced photograph; should they be too low, the status of the business will be reduced, the better class of customers bestowing their patronage on a rival. In both cases the business will suffer a falling-away of clients.

Whatever kind of work is done, there exists a close relationship between the *quality* of the photograph and the price it will command. The general public may not be expert judges of portraiture, of artistic merit, or technical finish, yet, by some means, they invariably form a correct estimate of the qualities of a photograph and the abilities of the photographer. The best work is always recognised as such; it secures a reputation and the consequent patronage. In most communities clients can be found who will support the man capable of giving them high-class productions, and are satisfied to pay good prices, simply for the name of the producer, as the hall-mark of superiority. Having this name, the photographer may almost fix his own prices, quite independent of what are the general rates in the locality. Once in possession of a name for superior work, it is essential that the reputation be sustained, and prices may then be fixed more on a knowledge of the social status of clients than in reference to the competition rate and the charges of other photographers. High-class portraits will always be sought after; they are obviously a luxury, and being comparatively rare they secure fancy prices; *they advertise themselves*, sitters are attracted from long distances, and the business ceases to be a purely local one. For these reasons, superfine work must always stand alone, the price being excessive, or, at least, very much in advance of the usual rates.

Beyond the field of work which depends for sale on quality alone, artistic taste, originality, and technical finish combined, there remains an opening for that which is supplied to meet a demand. There exists a permanent need for work of general excellence, supplied at rates that are not beyond the resources of intending purchasers, and hence the man who can meet this call at the lowest prices will secure the largest amount of patronage. Such prices are regulated entirely by competition of quality against price. If a locality is supplied by a photographer doing a certain quality of work, it will be useless for a competitor to ask higher prices for work of no better quality, or lower prices for work which is inferior. To attract custom, the portraits must be of better quality, supplied at the same or cheaper prices. To supply at a cheaper rate is, however, a mistaken policy, because it lowers the general rate; prices fall all around, and every photographer in the locality feels the effects—the competitor who commenced it in common with all others. To start a new business in a town hoping for custom on a reduction of prices is an error of judgment; it may succeed for a time, but, in the end, it must result in a general depression of prices. *The only way to successfully compete with others, and to keep a business together, is to improve the quality of work and raise the price.*

High prices are, in every instance, advantageous to the photographer. Photographs are, for business purposes, works of art; they cannot be classed with sugar or coal, as things people must have—necessaries, in short—and the price is not, like sugar or coal, fixed in the market to a large extent by the buyers. Skill enters largely into the production of photographs; it controls the price more than the cost of material or manufacture. The photographer has always to find a value for the skill he has displayed; if he puts this too low he degrades his status by under-valuing his abilities, and receives his profits, not on skill, but on cost of materials. By making skill the standard of value, the photographer receives his returns from that which yields the largest percentage of profit, and makes them independent of materials and cost of production, from which his profits can never be very large. In settling his prices,

the photographer must always take into account his training, the years he has spent in perfecting himself in his profession, rather than the bare cost of materials, etc., required in producing his work. Like the artist, he must charge for skill, and not merely to make a profit on the cost of paint and canvas. We thus see that the status of photographers controls greatly the prices of portraits; the higher the status of a photographer, the better able is he to demand, and obtain, a high price for his productions.

Beside this, he deals mainly with persons who are purchasing luxuries; the price paid by them will not interfere with or cause them to curtail their ordinary expenditure; hence, the photographer is dealing with clients who can afford to pay on a higher scale than could be expected for necessary articles. It is also generally overlooked that the photographer is not supplying a constant demand; his customers are mainly casual, and it is not to be supposed that a business of this nature can regulate its selling prices on the same lines as those which supply a daily or regular need.

The photographer who reckons the cost of material, wages, and indirect expenses, etc., and then allows over and above this a charge of 10 or 20 per cent. for profit, and puts his prices in agreement with the final figures, will soon find that it is impossible to carry on a business on these terms. Prices must be put to give quite 33 or 50 per cent. profit above cost of material, wages, and indirect expenses, otherwise a deficit will occur, arising from the fluctuating and casual nature of the trade in photographs. Even to deal in quantities at low rates does not yield a profitable return, because the market is not yet extensive enough. Millions of photographs must be supplied to make it pay, and such a demand is not yet reached. The intrinsic worth of a dozen portraits cannot be made the standard for regulating the selling price. The skill of the photographer, slack seasons, difficulty with help, advanced cost of materials, the fluctuating demand, the fact that the article is a luxury, and the first to feel a depression in trade—all these must be allowed for. From these various reasons, we conclude that the public are by no means overcharged for photographs, and that professionals would only be doing justice to themselves if present rates were advanced 25 per cent. all around.

Assistants' Notes.

Notes by assistants suitable for this column will be considered and paid for on the first of the month following publication.

Guide Negatives and Prints.

The best and quickest method of judging a thing, and arriving at a conclusion regarding that particular thing, is by comparing it with something else.

Whether the subject be a railway train, a tube of pigment, or a photographic negative this holds good. Comparison with other trains, tubes, or negatives, as the case might be, would prove the most satisfactory way of judging the subject's worth, for merits and faults are more noticeable—and *more quickly* noticed—when seen relatively.

It is with abstract properties or qualities, though, that comparison plays the bigger part; the *speed* of a train, the *brilliance* of a pigment, the *density* of a negative *are* comparative, and without comparison they cannot be truly judged unless scientific operations and calculations be resorted to.

The busy practician has no time for physics, but he has time for comparison if he cares to provide himself with a standard to compare by. Take the case of negative development. It is usually assumed that the time and temperature tank system is safer and more productive of good results than any other, where quantities are concerned, and it is, when practised with scrupulous attention and on correctly exposed plates. But, alas! as most printers know, the scrupulous attention and the correct exposures are often absent.

I once saw a tank-room which had a set of negatives (let into a window) which could be illuminated at will. They were, in the proprietor's estimation, perfect negatives.

Anyway, they were the kind he paid wages for, and the developing operative was expected to keep up the standard, whether he relied on time and tank or not.

Having those negatives in front of him *permanently* he could never go far off the track; consequently, "bunged-ups" and "shadowgraphs" weren't known in that firm.

To come to what I call a "guide print." I found some years ago that the presence of a really good print in the developing room enabled one to work away all day in confidence that when seen in daylight the prints would not show a percentage of "too lights" and "too darks." Since then I have put this to a very decisive test, and believe that readers of the "B.J." will be interested, particularly those whose business includes the development of large quantities.

Noticing that the output of the developing room—some two to three thousand prints per day—was showing a relatively large number of prints which were not of an ideal depth, I distributed guides among the operatives, with instructions to gauge each print as near as possible by the guide. *Immediately all waste on the score of too light or dark ceased.* I thought this was proof enough, but a few weeks later it was strengthened considerably.

The old failing suddenly reappeared as bad as ever, and on investigating the matter I found the guide prints were "non est." As they had become familiar with them, the developing operatives thought it time to "just not bother," hence the prints of mixed depths.

The guides are each composed of two prints, both admittedly good when viewed in full daylight, one representing the most usual, and the other the next most common, styles encountered.

They were placed back to back, covered with two clean glasses, bound lantern-slide fashion, and the binding varnished.

In use they are left lying handy on the bench, preferably in the full light of the yellow lamp. A turn of the eye serves to show if a developing print is *really* as dark as it should be or not.

J. Rouson Hall.

Photo-Mechanical Notes.

Laying Tints.

The engraving department of a newspaper, or the shop doing much work for newspapers, will have no difficulty in laying tints, because it will have shading mediums and the proper apparatus for applying the tints. The house not engaged in doing newspaper work is seldom provided with this equipment, and yet occasionally a job comes in requiring a tint over some part of it, and the question arises as to the best way to do it. No doubt the best way is to pull a transfer on Scotch transfer paper from an engraved tint plate, which was the method in vogue before shading mediums were invented. This needs, however, some skill in inking-up such a plate, and requires a copper-plate proving press to get the best results, and it is more unlikely to find the plate, the skill required, or the press in the average photo-engraving shop than it is to find a shading medium equipment.

But almost any sort of tint-plate can be made in the same way that any other subject would be reproduced. If a simple stipple dot is required, a sheet of white blotting paper is put on the copying board and a negative made with the screen, and such an exposure as will give the size of dot desired. If a line is required, the same method can be adopted, taking the precaution to use a slit stop of the correct size and having the screen at the right distance. A very good line effect can then be produced. Etchings can be made from these negatives, transfers pulled, and applied to the plate to provide the tint in the usual way, and though the best transfers will be obtained from plates etched slightly in intaglio, as mentioned above, this requires the ability to ink up the plate and prove it in the copper-plate manner. Or, finally, the tint can be applied by the method of sur-printing. The subject is printed on the metal plate first, and developed, burned in slightly if the print is to be an enamel one, the plate is recoated and the tinted printed over, and rubbed away after development where it is not wanted.

Light-edge Against Dark in Half-tones.

A PHENOMENON familiar to the general photographer, particularly in tank development, namely the occurrence of a region of greater density adjacent to a portion of deep shadow also bothers the half-tone etcher. Negatives will be stripped to exact size and mounted together on a large glass, there being left between each negative a space of clear glass. Now the edges of the negative will frequently be sky or some other bright portion of the subject. When the plate is put into the mordant, especially when etching copper, face down in a still bath of perchloride of iron, the high-lights adjacent to the solids printed from the clearglass spaces of the glass, will be attacked more rapidly and the dot sometimes etched away before the rest of the plate is nearly etched enough, and consequently the ink roller will dip there, giving a very disagreeable dirty effect where the plate should be brightest. The remedy is to give the mordant something to attack close to the light part, and the simplest way to do this is to take a piece of pointed stick and when the print is developed, and before enamelling, to rub away a little of the print from the black spaces in between, so that the acid will attack that part instead of exerting its entire strength on the edges of the picture next to these blacks.

Stripping Solutions for Wet Collodion.

THERE is some difference of opinion among operators as to whether the rubber solution and the stripping collodion should be thick or thin. There is no doubt, of course, that in the end one should have a film that is thick enough to handle without the risk of tearing, but if this is provided for, the thinner the solutions are, the more convenient to handle and the quicker to dry. The limiting factor for the rubber solution is that it must serve as an efficient insulator, to protect the collodion of the negative from being dissolved by the stripping collodion. If it does this satisfactorily, the thinner it is the easier to flow and the quicker to dry. If the stripping collodion is made from a suitable grade of cotton and has the proper amount of castor oil in it, it will be sufficiently flexible or "leathery" to answer every requirement, and again the thinner it is the easier to flow and the quicker to dry. Another advantage of thinner solutions for stripping is that the dangerous practice of lighting the coating to burn off the solvents in order to obtain rapid drying, can be prohibited, as it certainly should be. Some negative collodions are made from nitrated cotton that is so tough that with reasonable care they can be stripped without any rubber or collodion additional coatings, but most collodions are made from cotton that gives too fragile a film.

Using an Off-set Ink Image as a Negative.

A PATENT has been granted in the United States (No. 1,302,919) to J. A. H. Hatt, for a process of producing printing plates, which consists in preparing a sensitive coating on metal and then taking an impression on an offset roller from some design already prepared as a printing surface, transferring the impression on the sensitised plate, exposing to light, removing the ink image, developing, and then treating in the usual manner. The method is suggested especially for photo-lithography, and is to get more exact registration when several transfers are required in multicolour work than is probable in the usual way of making paper transfers. If positives are required from positives the first development will have to be reversed, as in the Vandyke process. One of the claims of the patentee is that by stretching or varying the tension of the offset surface before or after imprinting on it the design from the original printing surface, the size of the design on the final plate may be made either smaller or larger than the original design.

FORTHCOMING EXHIBITIONS.

September 13 to October 11.—London Salon of Photography. Entries close September 2. Hon. sec., 5a, Pall Mall East, London, W.C.1.

October 14 to November 29.—Royal Photographic Society. Entries close (carrier) September 19; (hand) September 20. Secretary, J. McIntosh, 35, Russell Square, London, W.C.1.

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Applications, August 5 to 9.

STEREOSCOPY.—No. 19,268. Stereoscopic cameras. A. L. Laurence and T. A. Locan.

COMPLETE SPECIFICATIONS ACCEPTED.

These specifications are obtainable, price 6d. each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

PRISM AND GRID FOR DIVIDING LIGHT PENCILS.—No. 127,308 (April 11, 1917). Fig 1 illustrates in diagram a photographic lens L and a sensitive film f, upon which it is proposed to form simultaneously at separated positions I, I', like images of the object-field of the lens L. Such arrangement may be used for taking

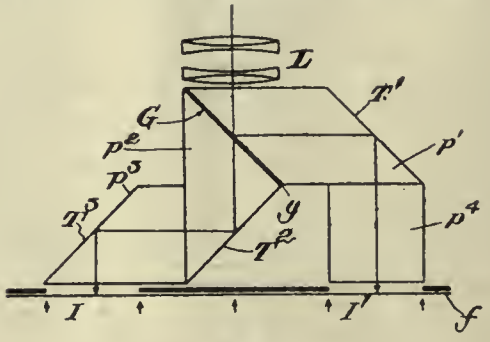


Fig. 1.

motion pictures enabling the simultaneous taking of two pictures of the same scene from the same point of view on the same film.

Behind the lens are arranged prisms p^1, p^2, having plane, totally reflecting surfaces T^1, T^2, and meeting faces in the plane y inclined at an angle of 45° to the optical axis of the lens. A prism p^3, having a totally reflecting surface T^3, adjoins prism p^3, and a parallel-faced transparent block p^4 adjoins the prism p^1. The image beam from the lens L will have optically equal paths

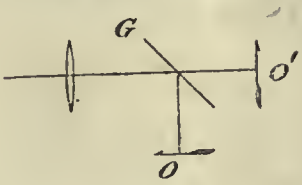


Fig. 2.

Fig. 4.

from any point in the plane y to the image spaces I, I', on the film f. The light-dividing means is located in the plane g to reflect part of the light through prism p, and thence through block p^4 to the picture space I' on the film, and to transmit part of the light through prism p^3, thence through prism p^3 to the picture space I on the film.

This light-dividing means consists of a grid G in the plane y. The grid G is characterised by irregularly shaped transmission areas r of a size separately perceptible to unaided vision, but so small as to occur in a relatively large number in the area of the grid normally included in the optical path. Reflection area or areas s occupy the remainder of the field. The total reflecting area (symbolised by A) bears a relation to the total transmission area (symbolised by R) which may be stated as $R = A/K$ where K is a constant expressing the numerical relation between the amount of light incident and the amount of light reflected by a continuous reflecting surface of the same kind as the reflecting areas. The values A and R may be varied as desired to vary

the intensity of the respective images. Thus, the total reflecting area may be enough larger than the total transmission area to compensate for the loss of light by reflection when images of equal intensity are to be formed.

The form and distribution of the respective reflecting and transmission areas are important to the result. The grid G, best

Fig. 3.

illustrated in Figs. 3 and 4, may be formed on a surface, for instance, of the prism p^1, by coating the reflecting areas s with a dense bright deposit, such as silver. The Brashear or the Rochelle salts precipitating methods may be used. The deposit is removed or prevented from being formed at the parts r of the surface, thus providing unobstructed light-transmission areas.

The light-transmission areas r of the grid G are irregular polygonal figures having straight or irregularly curved joint boundaries oriented and scattered at random on the field. The remainder of the field is the reflecting area s. The object of this mutual arrangement of reflecting and transmission areas is to avoid any systematic or recurrent series of parallel boundaries between the reflection and transmission areas, which would result in cumulative diffraction spectra.

The cumulative disturbances caused by light-dividing surfaces having reflection and transmission areas bounded by parallel lines or other regularly recurring boundaries will be explained by reference to the diagrams of Fig. 5.

The diagram I (Fig. 5) illustrates the image of a narrow bright vertical line viewed through a series of narrow vertical openings, assumed to be transmission areas of a light-dividing surface. In

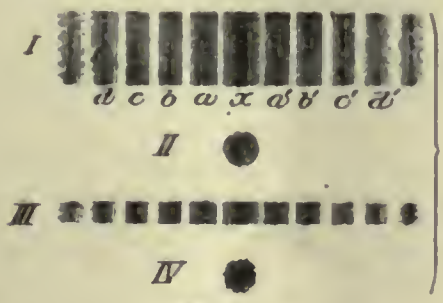


Fig. 5.

that case the image x in the direct line of vision is broadened by diffraction, as is well known, and on either side of the central image x dark and bright diffraction bands of different orders, a, a^1, b, b^1, *etc.*, appear, being wider or narrower and more or less displaced from x as the narrow vertical openings are narrowed or widened; and brighter as they increase in number.

If the object is a bright point the appearance shown in diagram III results.

If the bright point is viewed through a round hole instead of a slit, a similar series of bands concentric with a central bright image is formed (not shown). If a number of parallel series of slits at angles to each other are used, additional diffraction spectra result of the kind shown in diagrams I or III. The amount of light diffracted away from the direct path depends upon the number of openings in the grid, and increases as they increase, while the distribution of this lost light depends upon the geometrical distribution of the edges between the transmission and reflection spaces. Any such systematic and cumulative diffraction figures are avoided by the form and distribution of the transmission and reflection areas of the grid G of the present invention, the diffraction effect of the many openings reducing to that of a single opening r.

For such uses as photography the broadening effect of diffraction caused by a single opening r is within the expected definition losses usual to the apparatus employed, such as halation in the sensitive coat of the film f, errors of lens surface, etc.

The effect of the grid G is illustrated conventionally in diagrams II and IV, Fig. 5. Diagram II illustrates, greatly magnified, the image at f, Fig. I, of an artificial star, grid G being removed. Diagram IV shows the image of the star when the grid G is in place, similarly magnified.

The amount of the broadening of the image by diffraction caused by an opening r depends upon its size. The openings r must occur in the field of the lens with which they are used of such a size and in such frequency as not to form separate shadows. Referring to Fig. 6, if an obstruction s^1 is placed as shown, the point f^1 on the film f can receive no light from any part of the aperture of the lens L. If this obstruction is at s^2, then part only of the source of illumination of the point f^1 is obscured. If,

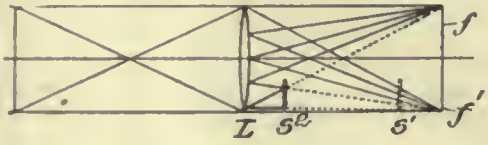


Fig. 6.

now, there are a number of evenly distributed obstacles s^2 near the lens, the loss of light on film f is not local but general, and there is no local shadow on f. The reflectors s of the grid G are obstacles analogous to the screen s^2 in Fig. 6, and their permitted size is that at which they do not form separate shadows on the film f.

In practice, for a lens of 2¾ ins. (70 mm.) principal focus and 1 in. (25.4 mm.) aperture, a grid averaging 16 openings to the linear inch (6.3 openings to the linear centimetre) is recommended. The reflection area may be continuous or discontinuous, but it is recommended that it be continuous, as shown, to enable better retention on the prism surface

For protection of the grid and to cause transmission of light striking the transmission surfaces at such angle that it would otherwise be reflected, the transmission surfaces are coated with an optical cement of greater density than the atmosphere, such as Canada balsam, filling the transmission openings r, and joining the two transparent prisms p^1 and p^2, between which the grid is enclosed. Daniel Frost Comstock, 1,407, Beacon Street, Brookline, Mass., and Technicolor Motion Picture Corporation, Boston, Mass., U.S.A.

Roll-Film Development Machine.—No. 126,814. (May 21, 1918.) Apparatus for the daylight development of roll films or plates comprises a flexible collapsible tube open at one or both ends, the ends being adapted to be closed by folding and secured by a clamp or clamps. In the form shown in Fig. 3, the appliance comprises a thin rubber tube A in which the film roll 1 is placed and the open end of which is secured round the wrist by a glove-fastener 3. The film is then unwound and the free end secured by placing a clamp on the tube. The developing solution is poured into the open end of tha tube beyond the clamp, which is then slightly loosened to allow the liquid to flow down the tube. The end of the tube is then folded over and secured by a clamp 5, which consists, as shown in Fig. 6, of two members, 7, 7*a*, pivoted at 8, and adapted to be held together at the other end by a pivoted U-shaped catch 9. In a modification, Fig. 8, one or two spools 14 may be revolubly secured to a weighted carrier 11 and unwound into the tube by gravity. The empty spools may be removed if both ends of the developing tube are open. Plates may be developed whilst held in a metal plate-holder inserted within the tube, or the plates may be removed from the holder and the latter removed from the tube. In modifications, the tube may be formed wholly of flexible coloured transparent material such as celluloid, or may be formed with windows 16 of red celluloid as shown in Fig. 11. A gauge line or retaining

strips 17, Fig. 13, to determine the point of application of a clip, enable the closed lower end of a developing tube to be em

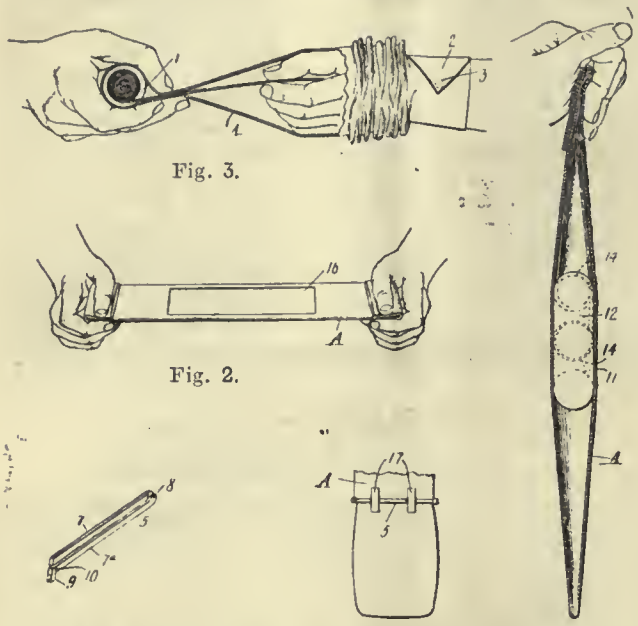


Fig. 3. Fig. 2. Fig. 6. Fig. 13. Fig. 8.

ployed as a measure or mixing vessel for the solutions employed. Ernest John Sweetland, Montclair, New Jersey, U.S.A.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

SATURDAY, AUGUST 23.

St. Clements Press Photographic and Rambling Society. Outing to Waltham Abbey, Simes Green, Nazeing, and Broxbourne.

TUESDAY, AUGUST 26.

Hackney Photographic Society. "Bromide Printing." W. Rawlings.

THURSDAY, AUGUST 28.

Hampshire House Photographic Society. "Passe-Partout." W. L. Wright.

News and Notes.

REVERSAL IN FILM NEGATIVES.—Our contemporary, "Photo-Era," has drawn its readers' notice to the remarkable case of reversal in tank development of plates described in our issue of May 16 last by Mr. W. Binns, and, as a result, has elicited details of a curious case of roll-film reversal from Mr. James C. Kerwin, a Boston photographic specialist. Our contemporary writes:—A six-exposure roll-film was developed with many others in a tank at a local photo-finisher's where Mr. Kerwin had charge of the developing room. When this roll of film was removed from the developing tank, exposures 1, 3, and 5 were negatives, and 2, 4, and 6 were positive. Two authorities in photographic physics were consulted, and, after a careful examination of the film, they came to the conclusion that this particular phenomenon was produced by carrying the camera about opened and with bellows extended. The owner of the film was questioned, and it was proved that the physicists were right with regard to the cause; but they could not determine positively the exact reaction that took place on the film. Briefly, the owner of the film visited a local point of interest on a bright sunny day. He opened the camera and made the first exposure. Then, with the camera still open and the film turned to the second exposure, he strolled about in the sunshine until he made the second snapshot, after which he closed the camera. Later, he made exposure No. 3, and carried the camera exposed to the full glare of the sun with the film turned to exposure 4. It was exposed and the camera closed for the second time. Exposures 5 and 6 were made in a similar manner before the camera was laid aside for the day. The theory advanced was that a certain amount of light—imperceptible to the human eye—and the radiation of heat in and around the camera penetrated to the sensitive film and produced over-exposure, which, according to reliable authorities, is conducive to reversal. The first picture was an ordinary instantaneous exposure. The second was also; but before exposure No. 2 was made, the sensitive film had received the action of light and heat due to the camera being carried about exposed to the full glare of the sun. This same reasoning applied to exposures Nos. 4 and 6. Whether this theory is sound or not has not been decided. At all events, it is plausible, and should furnish a basis for others to work in the endeavour to account for the above-described phenomena.

Commercial & Legal Intelligence.

A PHOTOGRAPHERS' AFFAIRS.—At the London Bankruptcy Court last week the public examination was held of Harold Aylmer Jones, photographer, whose statement of affairs showed gross liabilities amounting to £367 4s. 9d. of which £288 17s. 9d. was due to unsecured creditors. To preferential creditors £78 7s. 0d. of which £77 10s. was expected to rank against the estate making the total liabilities amount to £366 7s. 9d. The assets consisted of cash at bankers 17s., but that was absorbed by the preferential claims, consequently the net assets were nil, and the deficiency was returned at £366 7s. 9d. The receiving order was made on November 13, 1918, on the petition of the creditor, the act of bankruptcy being the failure of the debtor to comply with the requirements of a bankruptcy notice.

In reply to questions put by Mr. Garton, official receiver, debtor stated that having previously been engaged as a photographer's assistant, he purchased for £28, a photographers business at 30, Hill Street, Richmond, in March 1916.

In March, 1918, he purchased for £100, of which £60 was borrowed, a similar business known as "The South Kensington Studios" at 7, Gloucester Terrace, S.W., which he conducted whilst his wife managed the Richmond business. The Gloucester Terrace business was not successful, and he was compelled to borrow money from professional money lenders, who obtained judgment against him, and in September, 1918, sold his goods at Gloucester Terrace under an execution. He then took a furnished studio at 64, Brixton Road, S.W., at a rental of 25s. per week, including the use of apparatus. He closed it, however, after a few weeks trading owing to lack of business. In July, 1918, he separated from his wife, and at the same time gave her the Richmond business which she was conducting at the date of the receiving order. He alleged his failure to have been caused through losses in connection with the business at 7, Gloucester Terrace, and to interest on borrowed money. He had produced the Richmond order book, but the books in connection with the Kensington business have been mutilated. There were no book debts due to him. The amounts he paid into his bank were less than the amounts he received in the business, but some of the monies received from the Richmond business were paid into the account of the Kensington business. In April, 1918, when he found the Kensington business was a failure, he became aware that he had not sufficient property to pay his debts in full. When he transferred the Richmond business to his wife, he did not owe her any money. The quarrel with his wife arose through jealousy. He had now become reconciled to his wife, and they were living together, but they were doing very little business. Owing to the fact that he did not attend for his public examination on the previous occasion, a warrant was issued for his arrest in April last, but he obtained a suspension of the warrant, by producing a doctor's certificate. He had been too ill to attend the Court, but had now presented himself because his health was better. He had never been bankrupt before or compounded with his creditors. The examination was ordered to be closed.

Answers to Correspondents.

SPECIAL NOTICE.

In consequence of general reduced supplies of paper, as the result of prohibition of the importation of much wood pulp and grass, a smaller space will be available until further notice for replies to correspondents.

Moreover, we will answer by post if stamped and addressed envelope is enclosed for reply: 5-cent. International Coupon, from readers abroad.

The full questions and answers will be printed only in the case of inquiries of general interest.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

AMIDOL.—Under Sect. 6 [2] the weekly half-holiday is resigned by the assistant in consideration of receiving a fortnight's holiday on full pay. We think the position in your case is that you can demand one or the other.

A. W.—We do not know what process is used for the purification of ox-gall, but you can buy the purified form, which has very little smell, almost none, from Messrs. Rheinlander and Son, Rodney Road, New Malden, Surrey.

J. F.—If your camera has an extension of 20 ins. you can copy-enlarge from quarter-plate to cabinet with a lens of focal length as much as 10 ins. For convenience the focus should not be greater than 9 ins. Any shorter focus than this will of course serve equally well.

C. H.—You require to obtain a licence if you are now starting a studio, the Ministry of Labour having quite recently reversed its previous decision that a licence was not necessary. To obtain a licence you require to apply to the Secretary, Business Licences, New Arts Buildings, Liverpool.

W. J.—Your trouble is due to an excess of top light. You must cover up about half the light at the background end. Fix a fairly large reflector at one side so that it catches light from the roof to serve as a side light. You might even use a large looking-glass, placed at one side at the camera end and tilted so as to light one side of the figure. A glass about 3ft. 6in. by 2ft. would do. We have seen this done very successfully.

J. K.—All the books you mention are numbers of the "Photo Miniature," and we doubt if any of them are in print. You had better try Messrs. Houghtons, Ltd., 88-89, High Holborn, London, W.C.1. If they cannot supply, then you may be able to get them direct from the American publishers, Messrs. Tennant and Ward, 103, Park Avenue, New York. The price of the "Photo Miniature" is now 1s. 6d. in this country, 35 cents in America.

D. E.—For a fixing bath of sulphite and hypo, good working proportions are 20 ounces hypo, 2 ounces soda sulphite, both by weight, to 8 ounces of water. The second formula you give is a very bad one, because both the alum and the citric acid decompose the hypo and make the bath milky. You had far better make up the bath according to one or other of the formulæ contained in the "Almanac." The first of these is a better formula than your hypo and sulphite.

W. S.—Your trouble is probably due to your lens having an excessively curved field. As you do not mention the type of lens, nor the size of plate you are working, it is difficult to give any definite advice. In the case of groups it is necessary with any lens to work with a smaller aperture than for a single figure. A good anastigmat or a portrait lens of adequate size should define a full-length cabinet at $f/6$ and a group of four at $f/11$, if the figures are placed fairly close to each other.

A. W.—As regards the uranium intensification, we cannot guess as to the red transparent patches, but the best thing you can do now is to put the negative in a weak bath of washing soda, wash well, then put it for a few minutes in a weak bath of acetic acid, say, 1 dram in 10 ozs. of water, and, after a further brief washing, re-intensify with uranium. Washing soda is a much better means of removing intensification than sulphocyanide, which is generally used very cautiously for taking out yellow stain in the whites.

J. H.—1. You can try what a weak solution of ammonium sulphocyanide will do to take out the stains, a cause of which very often is the use of the hypo-ferricyanide reducer on a print which has not been completely washed from a fairly saturated fixing bath. 2. There is nothing in the appearance of print No. 3 to suggest that white specks have been caused by prints rubbing against one another or through abrasion from other substances. In the specimen sent, the white specks are very slightly in evidence.

W. E.—Either of your schemes will answer very well, but we think that you are providing an unnecessarily large quantity of light. Few studios have more than six 1,000 c.p. lamps. Five 3,000 c.p. in a single box would give a very concentrated light, and require a lot of screening down—that is, if all were alight at once. We rather incline to having each lamp with a separate reflector and diffuser, and also a separate switch for each. Thin calico is a better diffuser than tracing cloth. We think that with this the curved bar arrangement would be most effective; of course, the bar would be on a swivel.

G. W.—If you make the backing simply with gum, water, pigment and caramel, it is bound to take some hours to dry. You want to make the mixture with a fair proportion of methylated spirit. Make your gum as strong as you can, and as syrupy; then dilute with methylated spirit so as to make a mixture which flows freely under the brush; also, there is a great difference in caramels as regards drying. The best caramel for your purpose is the kind sold specially for making backing by Messrs. Lichtenstein and Co., Chemical Works, London, E. You can buy small quantities from Messrs. Johnson and Sons, Cross Street, London, E.C.

J. R. H.—We do not know of a design of strip printer for amateur film negatives if you mean a machine for making the prints in strips. Such an appliance, we should think, could be readily made an attachment to the film printing box of Mr. Marshall. We should doubt if a box of this kind is any quicker than the Kodak Quadruple Desk, assuming the user of both to be experienced. 1. The offices of the Ansco Co. in London are 143-149, Great Portland Street, W.1. 2. We believe Cyko papers are not now obtainable owing to import restrictions. 3. We have no reliable data, but, theoretically, the selenide should be more stable than the sulphide.

H. E.—There have been methods of toning three silver images, but the colours are very unsatisfactory, with the exception of the Prussian blue, very commonly used in three-colour synthesis. About the only yellow is one made by toning the image to one of lead chromate, but it is very opaque. Reds have been made by toning to mercuric iodide and other mercuric compounds. The failure of a whole lot of these processes arises from the opacity of these images. For three-colour work they do not compare with the use of a pigment or lake, as in the Raydex and carbon processes. Also, although we have not very fully considered it, we think you would have a great deal of difficulty in registering three transfers on each other.

J. S.—It is an uncommon problem, and one which we cannot recollect ever having been offered to us before. Generally, there is nothing in your procedure to account for it, and the only suggestion we can make is that the pinkiness of one print in fifty or so is due to the original black and white print not having been fully fixed before exposure to light in the hypo bath or immediately afterwards. Action of light at this stage, with a quantity of unaffected silver bromide in the emulsion, might conceivably leave a result which, while not appearing on development as a stain in the ordinary way, might show up as this slight pinkishness on sulphide toning. You must consider whether there is anything in this suggestion which corresponds with your practice.

H. W.—The address of the secretary of the Photographic Dealers' Association is Mr. A. Oglesby, c./o. Messrs. Sands, Hunter and Co., Bedford Street, Strand, W.C. There is a monthly paper for dealers—"The Photographic Dealer," Sicilian Avenue, Southampton Row, W.C. Trade terms to dealers range from within wide limits, according to the different classes of goods. At the present time your chief difficulty will be to obtain delivery of apparatus, such as small cameras saleable to amateurs. The trade is now very short of them, and at the present time a large part of the dealing trade is with second-hand apparatus. If we were you we should go very cautiously in spending any money just at present in establishing yourself as a dealer in new goods.

S. A.—1. In the British list of the Ansco Co., the buff Cyko paper is referred to also as "India tint stock," and it is this latter term which is used by the writer of the booklet on "Sketch Portraiture." We have no doubt the American house of Messrs. Ansco can supply this grade of the paper on your pointing out that you want the buff, either single or double weight. 2. Nigrosine is an aniline dye sold in two forms, one soluble in water and the other in alcohol, at a price here of about 1s. 4d. per ounce. No doubt you could get it, or its equivalent, from any of the dye houses in America. 3. The price of single issues of the "B.J." is 2d., or 3d. if posted to America. Numbers which are older than three months are charged double price—namely, 4d., 5d. post free to America.

H. H.—(1) We do not think it is the alum. It is more likely to be tiny air-bells on the print during fixing, preventing fixing from being complete. An after-bath of alum would make things worse if this is so, so you should try wiping the prints with cotton wool while in the fixer, and also use formaline 1 in 20 instead of the alum. If you do these two things we think the specks will no longer occur. (2) As a rule, no harm. (3) The fault is in mixing the starch. Use pure starch purchased from the chemists, and mix it first with only so little water that you can scarcely stir the mixture with a spoon or fork. Then pour on boiling water, and the paste will be as smooth as you can want it. (4) We do not see how the rubbing of cards can dirty the high-lights, but we are afraid we do not understand your question.

A. G.—(1) While prints are on the glass, a more or less waterproof backing paper is fixed on with thin, hot glue, or stiff dextrine paste, and the backed plates then allowed to dry. They can then be mounted without losing the glaze, or very often are simply trimmed down and used stiff as they are. (2) The white tank will make no difference whatever. (3) If the M.Q. developer intensifies, you are quite all right. Usually with this developer you have to redevelop in daylight, whereas with amidol you can dispense with daylight. (4) If the negatives to be printed are anything like some which you have sent us there is no artificial light except an arc lamp which is really satisfactory for rapid printing on gaslight paper. Your best plan is to fix up a printing box on your premises where it will get a north light, which will be fairly constant for the greater part of the day.

S. B.—We are unable to say which plates possess the highest gamma, but the reply which you quote was written from our knowledge of test exposures made some years ago by Dr. Mees and the late Mr. Welborne Piper at Messrs. Wratten's works. The kind of plate used was one like the Wratten Ordinary or Wratten Process Panchromatic, Imperial Ordinary, or Marion Academy Ordinary, in other words, a good liberally coated emulsion of approximately 100 to 150 H and D. With such a plate, in the case of under-exposures, it was found that the results by thorough development were actually better than with a plate of much greater speed, as indicated by the ordinary speed number. It needs to be emphasised that in the case of full exposures this effect of gamma does not come into prominence; it is only when you are giving an exposure which is perhaps only one-quarter or one-fifth of what you would like to give.

H. C.—We do not think that pitching of the wood has been the cause of the dichroic fog. If the fog is really dichroic—that is one colour by transmitted light and another by reflected light—the most common cause is a minute quantity of a solvent of silver bromide (e.g., hypo) in the developer. It is quite conceivable that by using the same racks for fixing as well as for washing you may have introduced hypo into the developing tanks. We should give the existing racks and tanks a good soak in a solution of permanganate, making up a permanganate bath of fairly deep ruby colour, but not so strong but that it is fairly transparent in bulk of, say, 20 ozs. Repeat treatment of the racks and tanks with this permanganate solution until the colour ceases to be discharged. If the cause is hypo absorbed in the wood this treatment should remove it. Of the tanks on the market, as good a pattern as any is one of enamelled ware supplied by Messrs. Brodrick, Ltd., 50, High Street, Charing Cross Road, London, W. You could varnish the present tanks with any celluloid varnish, but any varnish is soon damaged in use, and thus exposes the wood of the tank to absorption of the solution.

C. G.—To explain the cause of your failure with the anaplanat would necessitate a long discourse on the subject of depth of focus in general, but it may be helpful to point out that the greater the focal length of a lens the less depth there is with any given aperture when working on a given subject, such as the room you mention. We find from a catalogue that the No. 5 Busch Pantaskop has a focal length of 10 ins., and the No. 5 rapid aplanat having one of 18 ins., it would require a very small stop to give the needed definition throughout. As 10 ins. is not a short enough focal length to give a sufficiently wide angle on a 15 x 12 plate, the only thing to be done is to get a lens of shorter focus, such as the Dallmeyer wide-angle rectilinear or Ross wide-angle symmetrical, both of which have a focal length of 8½ ins. in the 15 x 12 size. The No. 4 Pantaskop might cover the 15 x 12, but we are not certain of this. Your best plan would be to apply to a dealer in second-hand apparatus and get some 8-in. or 8½-in. lenses on trial, telling them exactly what you want to do. It is a great help in taking such subjects to elevate the camera to 7 or 8 ft. from the floor and tilt it downwards until you get the view included, then set the back vertical. This will not only correct the perpendicular, but will bring the foreground into focus with a larger aperture than would othewise be necessary. This plan is generally adopted when taking flashlight pictures of public dinners.

The British Journal of Photography.

Line Advertisements.

Charges for Insertion.

Since advertisements cannot be inserted until fully and correctly prepaid, senders of line announcements are asked to bear in mind the scale of charges. They will thus save themselves delay in the publication of their announcements. A Schedule by which an advertisement can be correctly priced will be sent on request.

Net Prepaid Line Advertisements.

12 words or less 1/-
Extra words ... ... 1d. per word.
(No reduction for a series.)

Special Note. Box Number Advertisements.

"Box No." and office address ... ... charged as 6 words.
For forwarding replies add ... 6d. per insertion for each adv't.
If replies are called for this latter charge is not made.

Advertisements cannot be inserted until fully and correctly prepaid.

Orders to repeat an advertisement must be accompanied by the advertisement as previously printed.

Advertisements are not accepted over the telephone or by telegram.

The latest time for receiving small line advertisements is 12 o'clock (noon) on Wednesdays for the current week's issue.

Displayed Adv'ts should reach the Publishers on Monday morning.

The insertion of an Advertisement in any definite issue cannot be guaranteed.

HENRY GREENWOOD & CO., Ltd., Publishers,
24, Wellington Street, Strand, LONDON, W.C. 2.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3095. Vol. LXVI. FRIDAY, AUGUST 29, 1919. Price Twopence.

Contents.

	Page
Ex-Cathedra	497
Comparative Notes on Methods of Making Enlarged Negatives.—II.	498
Practicus in the Studio. By Practicus	499
Night Photography. By Robert Dykes, F.R.P.S.	501
Mapping From Air Photographs. By M. N. MacLeod, D.S.O., Lieut.-Col., R.E.	503
Assistants' Notes	505
Patent News	506
New Books	507
New Apparatus, &c.	508
Meetings of Societies	508
Commercial and Legal Intelligence	509
News and Notes	509
Correspondence—	
A Photographers' Club for Liverpool—Preventing Double Exposures: Preserving Ox-Gall: Soft Focus Lenses: Charges for Backlog—The Photographic Section of the Royal Air Force	509, 510
Answers to Correspondents	511

SUMMARY.

In the further instalment of his article on night photography Mr. Robert Dykes deals with the choice of plates and with the questions of exposure and development. (P. 501.)

In a second leading article reviewing the methods of making enlarged negatives we deal with those on the system of making a positive transparency the same size as the negative to be enlarged and producing from it the enlarged negative on plate, paper, or film. (P. 498.)

In his article this week "Practicus" deals with the chemical reduction of studio negatives, prescribing working instructions in the use of Farmer's reducer and in the employment of persulphate as a useful corrective of negatives which may suffer from the combined effect of slight under-exposure and over-development. (P. 499.)

A discussion of the various merits and demerits of the methods of preparing maps from aerial photographs is contained in a paper recently read before the Royal Geographical Society by Lieut.-Col. M. N. MacLeod, of the Royal Engineers. (P. 503.)

A letter from Mr. H. Hamshaw Thomas, an ex-officer of the Royal Air Force, takes up the question which we raised in reference to the future policy of the Photographic Section in our issue of last week. (P. 510.)

The essential features of cameras for aerial photography are described in two recent patent specifications. (P. 506.)

A contribution to "Assistants' Notes" deals with the fitting up of retouching desks particularly with a view to the comfort and convenience of the retoucher when employing artificial light. (P. 505.)

At a recent demonstration for the benefit of a Paris editor the photographic and photo-engraving staff of the "Daily Mail" prepared a half-tone block within thirty-four minutes of the original subject having been photographed on the Embankment. (P. 509.)

The death is announced of Mr. Henry A. Strong, a founder nearly forty years ago with Mr. George Eastman of the Eastman Dry Plate Company, which was the starting point of the subsequent enormous development of the Kodak enterprises. (P. 505.)

The present high price of silver, approximately 5s. per ounce, makes the recovery of photographic residues more than ordinarily remunerative. (P. 497.)

The suggestion of an attachment for the reflex camera similar in design to a trench periscope appears a cumbrous device for achieving the result which is readily obtainable in the ordinary use of a folding focal-plane at the eye level. (P. 498.)

The large-aperture telephoto lens of the fixed-focus type is one which apparently is not rated at its full value by Press photographers, who, usually, are restricted to a camera of limited extension. (P. 498.)

EX CATHEDRA.

Residues. If ever there was a time when it was worth while saving residues it is the present, when silver is about double the price it fetched a few years ago. Instructions for precipitating the silver from used-up fixing baths have been published so often that it is hardly necessary to reprint them. Moreover, most of the refiners are willing to give information upon the subject, Messrs. Johnson and Sons publishing a little booklet giving full details, and we believe furnishing suitable kegs for the purpose. In addition to the ordinary use of the bath it is a good plan to fix all waste bromide and P.O.P. as well as spoiled plates, so as to get all silver available into a form in which it can easily be dealt with. With metallic silver at five shillings per ounce it is worth while for those who are in only a moderate way of business to preserve their residues, while those in a large way should be doubly careful that nothing escapes the residue tub. Care must be taken to add sufficient potassa sulphurata to the hypo solution, but there should be no great excess. Moreover, the potassa sulphurata or "liver of sulphur" should be dissolved before adding, and not thrown in in lumps.

* * *

A Research Records Bureau. At a recent conference convened by the Department of Scientific and Industrial Research, and attended by representatives of research associations, the proposal to establish a "records bureau" of the results of research was the subject of some usefully constructive discussion, in which Mr. Conrad Beck and Dr. R. E. Slade took part. It may be explained that the intention is to establish a bureau to take charge of the papers and other memoranda representing the work of individual research associations. The bureau will thus be a kind of clearing house through which research made for one industry will be accessible for the benefit of others. We are thoroughly in agreement with the policy of the Department to limit, at any rate for the present, the scope of the bureau to such records. If its files be open to a wide flood of technical literature, the bureau is bound to become proportionately inert; it will tend to become a museum, or even a mausoleum. The tendency of such bureaux is to give decent burial to documents deposited in them, but the determination of the Department is to resist the conception of its files as dead matter, but instead to extend their sphere of life by the Department's knowledge of the needs of each individual research body. This is an excellent policy, which should assure for the Records Bureau a total service higher than that of the far more comprehensive but less actively alive bibliographical institute, such, for example, as that at Brussels. Evidently it is to differ from these latter somewhat as a current technical periodical differs from the "Encyclopædia Britannica."

A Periscope for the Reflex. According to an American contemporary, an inventor has introduced a periscope—of the trench, not the naval, pattern—for the reflex camera, so that the Press photographer is thereby enabled to bring his view-point up to eye-level and save the situation for himself when the line of sight at waist-level is blocked. American Press photographers must be much more widely pledged to the use of a reflector camera than we imagine them to be if this cumbrous device finds any extended use. Here its suggestion merely signifies the disability of the reflex type of camera, which has led Press photographers to adopt almost exclusively the folding focal-plane instrument in preference to it. Lightness and portability apart, the folding focal-plane is the popular choice of the Pressman, largely for the reason of its effective use at the eye-level or higher, if need be, by holding it with the hands raised above the head. When this advantage is secured so easily there can be little inducement to attach a giraffe-like fitting to the reflex, nor to run the risks of cut-off and impaired definition on the plate which the twice-repeated reflection in the periscope involves.

* * *

Lenses for Press Work. For very good reasons the Press photographer, who has to focus by scale when using a lens with an aperture often as large as f/4.5, chooses one of as short a focal length as possible, but by so doing handicaps himself to a very great degree in the choice of subject, as many incidents which would make saleable pictures are in inaccessible positions for short-focus lenses. This is especially true of sports pictures, where the exigencies of the game, and the vigilance of the officials, keep the photographer at a distance. Obviously it is not practicable to use long-focus lenses of the ordinary type as the camera would be unwieldy, and there would be the necessity for carrying an extension body if the ordinary collapsible type of camera is adhered to, but by the adoption of the modern types of fixed focus tele-objectives it is an easy matter by simply changing the lens to get an image rather larger than twice linear from any given position as compared with the ordinary lens. In the early stages of telephotography much was anticipated from the telephoto lens, but as a rule the covering power at a magnification of two diameters was poor, and the definition not by any means sharp. With lenses made to work sharply at low magnification at such apertures as F/6, or even f/4.5, the circumstances are much more favourable.

* * *

The Import Restrictions. It is difficult to know exactly where we stand with regard to the importation of foreign goods. Apparently the elaborate consolidated list compiled by the Board of Trade, to which we referred in our issue of August 8 last, has now been completely knocked on the head by a memorandum issued by the Board of Trade on August 22 in supplement to the Prime Minister's sweeping statement in the House of Commons that restrictions on the importation of goods were to be removed. It now appears that these restrictions are preserved in the case of what are called "unstable key industries," the products of which are to be protected by the exclusion of like foreign articles. It is clear from the list of these key industries contained in the memorandum that certain products used in photography are thus protected, viz., sensitising dyes, synthetic photographic chemicals, and lenses. By "synthetic photographic chemicals" is presumably meant substances like developers. The list of the other substances which come in the same category agrees with this assumption. Pyrogallic acid is specifically mentioned in this list. The position with regard to other photographic requisites is by no means so clear. "Scientific and optical instruments" is one of the key industries which is the subject of exclusion. The question thus arises whether cameras without lenses are "scientific instruments"; it is difficult to see how they can be "optical instruments." Evidently it will be necessary to wait for more definite decisions by the Board of Trade before this emergency and bureaucratic control of importation can be understood.

COMPARATIVE NOTES ON METHODS OF MAKING ENLARGED NEGATIVES.

II.

In the preceding article of August 15 we reviewed in a general way the methods which can be used for the making of enlarged negatives, and in particular those involving the making of an enlarged transparency. In the present notes we must come to the more commonly employed process in which a same-size positive transparency is made, usually by contact, and is enlarged to form the enlarged negative. The obvious advantages of this system are that it utilises the ordinary enlarging apparatus, it being just as simple to make an enlarged negative from the small positive as it is to produce the positive enlargement from a small negative. In comparison with the making of an enlarged transparency there is a somewhat lesser degree of facility in carrying out any retouching or other handwork on the negative, yet as a rule the small transparency allows of all that is necessary in this respect. If the system is less convenient and precise for the insertion of clouds into the enlarged negative the drawback may be thought to be more than counterbalanced by the extra labour of making the negative in the camera which the enlarged-transparency system involves. A good deal of discussion has ranged around the material which is most advisedly used for the making of the small transparency, the alternatives being carbon tissue or a dry-plate. For the former it can be maintained that the resulting enlarged negatives are necessarily better from the fact of the almost automatic reproduction of gradation in a carbon print as compared with the facility for variation from that gradation by errors in the exposure and development of a dry-plate. Advocates of the dry-plate, on the other hand, have emphasised its non-dependence on daylight and consequent greater speed in use. Without doubt, in the hands of the experienced, the one method will yield as good results as the other, and, again in the hands of the experienced, the dry-plate possesses a latitude which permits of effecting a considerable degree of improvement when making the transparency from a hard or a flat negative. On the other hand, with dry-plates it is difficult for the beginner to tell when he has made a transparency of the right kind. In this respect, presuming that the original small negatives are of good quality, the carbon process offers a much narrower field for mistakes than does the dry-plate, although it must not be forgotten that the carbon transparency, owing to its image existing in relief, requires more care in enlarging, and preferably should be illuminated by a system of perfectly diffused light such as daylight or a white reflecting surface instead of by the concentrated direct light of the ordinary condenser enlarging lantern. On the whole, it may be said that there is little to choose between the two alternatives when their individual facilities and drawbacks are considered.

When we come to consider the making of the enlarged negative, it is clear that choice will fall upon a dry-plate, bromide paper or Transferotype paper according to the particular requirements of the case. For the most straightforward enlarging and at the same time for the retention of the maximum "quality" of the original nega-

tive, a dry-plate of ordinary speed will be used; but, apart from other factors, among which is cost, the weight and fragility of enlarged negatives in any number offers a great inducement to replace the dry-plate by bromide paper. While most excellent enlarged negatives may be made in this way, it may be fairly said that their average quality is lower than that of negatives on plates, no doubt on account of the somewhat greater uncertainty of judging of the progress of development. On the other hand, the readiness with which both sides of paper negatives may be worked up with pencil or stump is a great point in their favour. The grain of the paper imposes the use of a matt or rougher medium for the prints, but that is a negligible item, since a matt-surface paper is likely to be used in any case. Oiling or varnishing of the paper negative has scarcely any discoverable effect in reducing this grain, and the maker of paper negatives may be recommended to forgo any "translucing" process altogether, for the comparatively small advantage in quicker printing on a print-out paper is certainly not worth the trouble and mess of rendering the paper more or less transparent. In this scheme of things Transferotype paper occupies a niche of its own in its facility of being handled like bromide paper until development, fixing, and washing are complete, and then of being transferable to glass for the production of a negative which differs in no way, except as regards a slight grain, from one made on a dry-plate.

A choice for the maker of enlarged negatives which comes as a kind of intermediate between the processes employing an enlarged transparency and those using a small one is that in which an untoned and unfixed contact print is made on P.O.P., and photographed directly in a copying camera on to the large negative plate or bromide paper. This method, which is most expeditious in use, is one also which retains to an excellent degree the quality of the original negative. It can be understood that a P.O.P. print is a first-rate positive facsimile of the negative, and can be copy-enlarged in the camera by artificial light without suffering any flattening of its contrast by general light-action. If preferred, the P.O.P. print may, of course, be printed more deeply and toned and fixed in the customary manner, but there is actually no necessity for these additional operations. The process calls, of course, for a copying camera capable of taking a plate the size of the enlarged negative, and, therefore, perhaps is less likely to appeal to the ordinary amateur worker than is one in which a plate or paper of any size can be handled upon an enlarging easel. For professional use the process is one which deserves to be more generally used than, so we judge, it is. If our memory does not deceive us, it was this process which was placed first in the list of available methods, such as those we have outlined in these notes, for its results and convenience by Dr. D'Arcy Power, of San Francisco, in the course of making a series of comparative tests of the "quality" obtainable in enlarged negatives by the various methods available for their production.

PRACTICUS IN THE STUDIO.

[Previous articles of this series, in which the aim of the writer is to communicate items of a long experience in studio portraiture, have appeared weekly since the beginning of the present year. It is not thought possible to continue the series to the length of that by the same writer which ran through the "British Journal" some years ago, but if any reader among the younger generation of photographers, and particularly those engaged as assistants, has a particular subject which might be dealt with, his or her suggestion will be welcomed. The subjects of the previous articles of the series have been as follows:—

A Talk About Lighting (Jan. 3).
The Camera and the Lens (Jan. 10).
Managing the Sitter (Jan. 17).
Backgrounds (Jan. 24).
Studio Exposures (Jan. 31).
Artificial Lighting (Feb. 7).
Printing Processes for Portraiture (Feb. 14).
Studio Accessories and Furniture (Feb. 21).
The Surroundings of the Studio (Feb. 28).
Studio Heating and Ventilation (March 7).
The Postcard Studio (March 14).
The Printing-Room (March 21).
About the Reception Room (March 28).
Home Portraiture (April 4).
Portable Studios (April 11).
Copying (April 18).
Handling the Studio Camera (April 25).
More About Lenses (May 2).
Enlargements (May 9).
Advertising the Studio (May 16).
Mounts and Mounting (May 23).
Business Methods (May 30).
Photographing Children (June 6).
Portraits of Elderly People (June 13).
Something about Lenses (June 20).
Hand Cameras for Professionals (June 27).
The Dark-Room and Its Fittings (July 4).
Plates and Their Work (July 11).
Apparatus Repairs and Renovations (July 18).
Posing the Head (July 25).
Intensifying Portrait Negatives (Aug. 1).
Workshop Jobs (August 8).
The Personal Factor (Aug. 15).
The Keeping of Negatives (Aug. 22).

THE REDUCTION OF NEGATIVES AND PRINTS.

Although almost as necessary a process as intensification, the reduction of photographic images, either negative or positive, is not usually carried out with equal success, even the simplest methods being regarded as risky by many operators. There is no good reason for this idea, for with ordinary care there is no danger either of destroying the image or staining the film.

Nearly all non-mechanical methods of reduction consist in converting a portion of the metallic silver image into a soluble salt which can be removed by a "fixing" agent such as cyanide of potassium or more commonly hypo, the outstanding exception being the persulphate method, in which a silver salt soluble in water is formed.

The process of reduction, like that of intensification, may be carried out in either one or two stages, the latter being the earlier form, the soluble salt being formed by immersion of the negative in one solution while the removal was effected in another. As examples of this, I may give a preliminary bath of perchloride of iron or of diluted tincture of iodine followed by a plain solution of hyposulphite of soda. This procedure was effective in its way, but had the disadvantage of not being under control, as it was difficult to judge of the amount of reduction until the negative was removed from the hypo bath. It was therefore a great advance when Mr. Howard Farmer introduced the ferricyanide and hypo reducer, in which the conversion of the silver into a soluble form and its solution took place simultaneously, thereby permitting any desired degree of reduction to be obtained.

It should be noted that in the case of nearly all reducing

solutions the degree of concentration has a marked effect upon the result, a strong solution dissolving the more delicate half-tones away entirely before any perceptible effect is made upon the high-lights, while a weak solution has a more even effect all over the image. This may be taken advantage of, as it allows of fog being quickly removed by a strong solution if it be desired to do so before intensification.

Most of the troubles which occur in reduction may be avoided if ordinary care be exercised in preparing and using the solutions, and I therefore give clear instructions which, if followed, will help to avoid stains and uneven action.

The ferricyanide and hypo or Farmer's reducer is the most generally useful, as its action is easily controlled, and there is no difficulty in its preparation. Where it is in constant use the best plan is to have two stock bottles, one containing a plain hypo solution containing three ounces of hypo to the pint, and the other a 10 per cent. solution of potass ferricyanide. These are mixed for use in such proportions as may be needed, the colour being a good guide. Thus, if we take, say, two ounces of hypo solution and add to this enough ferricyanide solution to give a pale lemon yellow, the action will be slow, but even—that is to say, that the high-lights will be reduced in the same proportion as the shadow details or any fog which may be upon the deep shadows. A large proportion of ferricyanide, giving a deep golden yellow, acts very quickly and will clear fog off the deep shadows of a negative before it has time to penetrate into the film sufficiently to affect the image to any appreciable extent. This property is very useful when dealing with over-exposed and over-developed negatives, such as are occasionally met with in tank development. It is a good plan, and economical of chemicals, to apply the strong solution with a swab of cotton wool, of course keeping the latter in constant motion. This also allows of a little local action, so that a white skirt or bodice may be reduced without unduly affecting the face, hands, or other draperies.

There are a few precautions which must be taken to make sure of clean working. The hypo solution must be clean and fresh, and an acid fixing bath must not be used. A weak hypo solution must not be used, as this tends to give yellow stains. I have seen it recommended in some text-books to take a couple of ounces of water, to add to this a few drops of fixing bath and a few drops of ferricyanide solution to make the reducer. Such a proceeding leads to an unjust condemnation of the method as useless. The mixed solutions must not be used in a strong light, as the ferricyanide is rapidly decomposed, the solution first bleaching and then turning a pale blue. Some workers prefer to dissolve the crystals of ferricyanide directly in the hypo solution. This is equally effective with using a 10-per cent. solution, but is a little more trouble, as the mixed reducer will only keep active for a very short time.

If through disregard of the foregoing precautions yellow stains occur, they may generally be removed either by the iodine and cyanide reducer or by a weak solution of potassium cyanide.

While the "Farmer" reducer tends to give increased contrast, the persulphate reducer has an opposite tendency, and will so alter the character of a harsh under-exposed and over-developed negative that quite soft prints may be obtained. It is very simple in action, but, curiously enough, I have found more people make a mess of its use than almost any other process in negative-making. Flat over-exposed negatives are not suitable for this method, no matter how dense they may be. The type that it is especially useful is a sitter in dark clothes, where there has been considerable under-exposure, and the hands and face over-developed in an attempt to secure detail in the shadows.

We require two solutions, both of which should be freshly made. One is ten grains of ammonium persulphate to each ounce of water. This I usually mix in the dish immediately before use. The other is a 5-per cent. or, even better, a 10-per cent. solution of sodium sulphite, which is kept in a dish ready for immediate use. The negative must be perfectly free from hypo, and should be well soaked in water before reducing it if it has been allowed to dry after fixing and washing. It is then immersed in the persulphate solution. The action may commence at once, or it may be ten minutes before any action is visible, which, if the solution be made with tap water, is manifested by a milky appearance. As soon as this is noticed the negative must be constantly watched, as reduction then proceeds rapidly, and it is easy to overdo it. As soon as the desired point is reached the negative is quickly rinsed under the tap and transferred to the sulphite solution, in which it should remain at least ten minutes, after which it should be well washed.

Some samples of persulphate will not attack the image at all until slightly acidified. If no action is visible after ten minutes' immersion, remove the negative from the solution and drop in a very small quantity of dilute sulphuric acid (one part acid to nine parts water). Ten minims of this is ample for two ounces of the persulphate solution. If too much be added, the action will be very rapid and uneven, the image going to a pinkish ghost before the action can be stopped. If the negative has been handled with fingers contaminated with hypo, any portions which have been touched will refuse to reduce or, at all events, hang back behind the clean portions.

A very clean and useful reducer is that composed of iodine and cyanide of potassium. The action of this is very similar to that of the "Farmer" reducer, but as it is extremely poisonous, it is not so generally used. I have, however, found it so useful upon stained negatives and prints that I give details of its preparation and use for those who are careful not to leave cyanide about loose. This caution may seem superfluous, but when I say that I have seen a girl using a 5-per cent. solution of cyanide from an ordinary teacup which a few minutes before had been used for its legitimate purpose, it is not so in all cases.

Two stock solutions which will keep indefinitely are made thus:—

A.—Potass iodide	150 grs.
Water	2 drachms
Iodine (in flakes)	45 grs.
(Stir till dissolved and make up to 1 oz. with water.)	
B.—Potass cyanide	1 oz.
Water to	10 ozs.

For use, take for average work 30 minims of A. and 5 minims of B. to each ounce of solution. It may be used much stronger or weaker, to suit special cases. I have found this reducer very useful for cleaning green fog off negatives, and also for removing the muddy appearance caused by the forced development of bromide prints. I prefer this reducer before all others for lantern slides or other transparencies, as it does not alter the colour of the image in the slightest degree.

Both this reducer and the ferricyanide and hypo are suitable for bromide and gas-light prints, but I have not found it desirable to immerse the prints in the solution. A better way is to lay the print on a glass plate or the bottom of an inverted porcelain dish and to swab the solution over with cotton wool, occasionally rinsing under the tap. Stained margins may be cleaned and faulty vignettes corrected very easily.

There is another way of using iodine for reducing bromides which may be referred to, as it affords a means of brightening up a flat print. It is to take, say, a drachm of the iodine solution (A.) in ten ounces of water and to immerse the print until the high-lights begin to turn blue. The back of the paper quickly turns blue, but no notice must be taken of this. The print is then rinsed and transferred to a plain hypo bath (3 ozs. to the pint), in which it should be left for five minutes. If the reduction is insufficient, the process may be repeated, taking care to wash out all traces of hypo thoroughly beforehand.

I have found no really satisfactory way of reducing P.O.P. prints without altering their colour. On the whole, a very weak solution of cyanide seems the most satisfactory. A drachm of 10-per-cent. solution in a quart of water is quite strong enough, and with some papers this might be diluted to one-half strength. The reduction should take place slowly or the half-tones will entirely disappear. PRACTICUS.

NIGHT PHOTOGRAPHY.

[Perhaps no branch of outdoor photography offers so great a degree of attractiveness as that of outdoor scenes under artificial illumination, particularly to those in large cities where an abundance of subjects of this kind is available. Since the immediately forthcoming season is the best time of year for night photography we take the opportunity of publishing a comprehensive practical article on the subject by an expert in it of long experience, Mr. Robert Dykes, F.R.P.S., formerly senior scientific assistant to the late Sir John Murray, K.C.B., F.R.S., and of the North Sea Fishery Investigations. Part of these notes appeared in a manual on night photography by Mr. Dykes, issued some years ago by Messrs. Dawbarn and Ward, but long out of print. In the final instalment of this article Mr. Dykes describes a method of introducing night and interior subjects into cinematograph films.—Ed. "B.J."]

(*Continued from page 487.*)

COMING now to the question of plates and films. Any plate or film may be used, no matter how quick or how slow, only as we do not care to stay out all night over an exposure—the quicker the plate the better. I have seen it stated that it is immaterial what speed of plate you use at night; that a slow plate, given the same exposure as a rapid one, will give identical results. Now, as far as my experience goes, this is incorrect, as I know to my cost. My advice—and it is based upon over one hundred experiments with different plates—is use the quickest plate obtainable. We have a large selection to choose from, and it is quite unnecessary for me to enumerate the many different varieties all equally good. Perhaps one of the best for its rapidity, close grain, and clean working, is the Ilford "Monarch" backed. I use a great many of them.

Backing plates is a somewhat troublesome and messy proceeding, but a very necessary one in night photography. It is preferable to purchase one's plates already backed and to give them an additional coat when used against a wealth of artificial light, such as exposures in railway stations. As a rule, the plate-makers put on the backing in a highly uniform manner, but the plates should be examined before use to see that there is no streakiness or brush markings. The marks develop up very frequently, causing peculiar aurora borealis effects; this is a common complaint in backing plates oneself unless care be taken. Mawson's "Antalo" is very handy for putting on an extra coat. To apply it, lay the plate emulsion side down on a pad of red blotting-paper, shake up the bottle thoroughly, and pour about ten drops or so upon the centre of the plate and spread it carefully over the whole surface with a soft camel's-hair mop. Badger's hair or other forms of brushes are too hard, and tend to cause streaks. After a few moments the plate will be sufficiently dry for use. All this work must be done in the dark room with a perfectly safe light.

The object in backing plates is to prevent halation due to high-lights such as electric arc lamps, but no amount of backing will entirely prevent it; and although too much is a decided fault, a little is indispensable to give atmospheric and pictorial effect.

Double-coated plates such as the "Seed" dispense with the need for backing. They are almost entirely free from halation, and should most certainly be used if it is intended to make lantern slides of the views taken. The high-lights stand out crisp and clear, and are free from "circles," "flares," and radiating rays, the latter due to either streaky backing or to halation. Some extraordinary effects of halation have been obtained by the writer due to using unbacked plates and bad choice of position for lighting. In many cases the rays from the high-lights terminated with peculiar knobs, so that one had a street lamp with rays radiating outwards from the centre, and each ray like a rod with a knob on the end of it. Again, it was a common occurrence to have around each street lamp or other high-light a series of rings from the centre outwards: first, the white centre light, then a dark circle, and then another white circle or halo. These peculiar effects, of course, are characteristic of extreme forms of halation.

Rapid ortho- or panchromatic plates are excellent for certain classes of night photography, but there is considerable risk of light-fog and chemical-fog in development, especially if the development is prolonged to obtain detail in the shadows. If used against a wealth of light, with a quick lens at $f/3.5$, and at an exposure of about one-fifth of a second, there is practically no time for serious over-exposure on the high-lights and consequent halation, and the shadows will yield what detail they have by fairly rapid development, i.e., ten to twenty minutes.

Before attempting to give some idea of exposure and the method of development, I may with advantage offer a little advice as to prospecting for likely views, and some of the things to avoid In choosing a point of view, certain little things should not be overlooked. In the first place, the nearest and brightest light, whether it is objectionable, and if so, how to avoid it. The best time for taking the view must be considered; if too late at night a large amount of the light required to build up the picture may be off, owing to shops shutting, etc. Then, if too early in the evening, there may be a great many moving lights, or, what is worse, a cab rank, and cab ranks are a rank nuisance at night from a photographic point of view. Or perhaps one may be photographing in a park when it is about to close, and the camera must perforce close also, and you clear out. The lights of bicycles, or any forms of vehicular traffic should be kept out of the lens, no matter how rapidly they may be moving, or the plate will be crossed by innumerable black lines, that on printing will look like scratches, clothes lines, or telegraph wires.

To the novice, the question of exposure by day or by night is a vexed one, and, judging by the look of some daylight productions, they might at first be considered as night effects, until you are informed that this or that view was taken in the middle of the day or late in the afternoon, with an exposure of about 1-1,000 of a second, or even less. An actinometer can-

not be used at night, and only experience will teach the correct exposure. In exposing, a little on the over side is better than on the under, as it is easily remedied in the dark room, and it is exceedingly annoying to find nothing on the plate after a long tramp and half an hour spent in development, all through under-exposure. If the sky be particularly dark there is not much risk of over-exposure; it is when illuminated by a full moon or on a summer night, when distinctly blue, that one runs the risk. There is an old saying amongst photographers with regard to daylight work, viz., "expose for the shadows, and let the high-lights take care of themselves." Well, this is equally applicable to night work. Get all the details possible out of the shadows, and the worst that can happen is the reversal of the *centre portions* of high lights, such as arc lamps. It is a comparatively simple matter to put this right with a brush. Strictly speaking, a properly developed night negative *is under developed in the high-lights, and fully developed in the shadows.*

I have prepared a table of exposures which may be of some assistance. It is only approximate, but if used judiciously it will be found correct. Of course, its use is restricted to pure night work, as I do not believe in the methods adopted by some photographers of giving a short daylight exposure first and then waiting until darkness has set in to complete it. Such methods are quite unnecessary, and only give flat results, not to mention the time wasted.

TABLE OF APPROXIMATE EXPOSURES FOR NIGHT WORK.

Subject.	Weather.	Month.	Time.	Stop.	Plate.	Exposure.‖
Open street scenes, squares, panoramic views, illuminations, extensive harbour scenes, etc., well lighted with either electric or incandescent gas.	Clear, cloudless, with or without frost, after a heavy fall of snow, with a full or half moon. After a shower of rain, with wet pavements, etc.*	From Sept. to Feb.†	8.30 p.m. to 3 a.m.‡	*f*/11.§	"Seed" Ilford Monarch. Imperial Special Rapid.	15 minutes. 20 ,, 30 ,,
Country scene with very little or no artificial lighting.	Only possible under above weather conditions.	Ditto.	..	..	"Seed." Ilford Monarch. Imperial Special Rapid.	30 ,, 40 ,, 50-60 ,,
Close views in small streets or at street corners, in dark squares not too well lighted, principal objects in foreground.	Ditto.*	Ditto.	..	..	"Seed." Ilford Monarch. Imperial Special Rapid.	20 ,, 30 ,, 40 ,,

* Any other conditions than these, such as no moon, very dark and overcast, cloudy, no rain or wet reflections, no snow, add ten minutes.
† During summer months five minutes should be deducted when the sky is cloudless.
‡ During summer months 11 p.m. to 2 a.m.
§ Stop value the same as for daylight work.
‖ I have obtained a negative with an Ilford Monarch, Cooke lens *f*/6·5, and an exposure of fifteen seconds. The above exposures are very full, and it may be necessary sometimes to shorten them; but it is advisable not to do so if possible, unless working with a lens having a full aperture of 3·5 or 4·5, when the exposure may be reduced to a fraction of a second. The above table remains as it was first published by the writer, the aperture *f*/11 being adopted because this aperture is available for every photographer possessing a camera.

In the dark room commences the real work of night photography. In the first place, cleanliness has to be strictly observed—clean dishes, clean hands, clean solution free from sediment, and a perfectly safe light. Whatever developer we may use, it must be diluted down very considerably; quick developers such as paramidophenol, more so than slow ones such as pyro-soda, for our plate has to be coaxed up slowly, not driven or forced. As a rule a plate should not be developed in less than twenty minutes or over forty minutes; generally speaking, it may be finished in half an hour. The reason for failure by many who attempt night photography is that they treat the plate as they would a daylight exposure, and use a strong developer. As a consequence, up flash all the high-lights black and dense, and the shadows—well, there is nothing else but shadows when the plate is fixed, with a lot of black circles indicative of light. Therefore, dinna forget to "drown the miller" and dilute well—it's no' a drink.

As to developers, there is nothing like pyro-soda, and I can hear every photographer echo these sentiments for his own favourite developer, whether it be pyro, hydroquinone, or any one of the many different preparations to be found on the market. We all swear by what we have got into the way of using, therefore I would advise no change for night work, but simply to dilute freely the developer we like best.

In using pyro-soda too much developer in a diluted state should not be made up at once, as in this condition it is rapidly oxidised and stains the negative. For this reason a plate should not be left longer than ten minutes without changing the solution.

Stain may be removed by an acid permanganate bath, but chemical fog should be absolutely avoided. A common source of chemical fog is brought about by the oxidation of sodium sulphite to sodium sulphate. In the cinematograph industry this is an everyday occurrence owing to the very large quantities of chemicals used at a time to make up the big developing baths, and, as a result, a very large percentage of the sulphite used is really *sulphate*, and I have seen cinematograph film chemically fogged in less than a minute upon immersion in such a bath. Oxidation of sodium sulphite takes place in the dry state, and it is essential that air-tight jars should be used for storage—*in fact, all photographic chemicals should be kept in air-tight jars*, with the exception of hypo.

The formula I use is the "Imperial Pyro-soda," made up as follows:

"IMPERIAL PYRO-SODA" DEVELOPER.

Stock Solution.

Pyrogallic acid	1 ounce
Potassium bromide	60 grains
Potassium metabisulphite	50 grains
Distilled water, to	12 ounces

No. 1.

Stock solution	3 ounces
Water (boiled), to	20 ounces

No. 2.

Soda sulphite	2 ounces
Soda carbonate	2 ounces
Water (boiled), to	20 ounces

For normal daylight exposures use equal quantities of No. 1 and No. 2.

For developing night exposures use four drachms of No. 1 to five drachms of No. 2 in about sixteen ounces of water. To finish off a plate rinse it in a little stronger solution—viz., one ounce of the normal developer (equal parts No. 1 and No. 2) in eight ounces of water. This must not be allowed to act on the plate longer than one minute; it is simply used to strengthen up the detail. Do not add bromide to the working developer unless with a camel-hair pencil to retard a too obtrusive high-light on the plate itself. If the plate is not rocked too much a certain amount of bromide is formed in the solution immediately over the high-lights, and helps very considerably to hold this back. One of the beauties of pyro is the amount of juggling that can be done with solutions No. 1 and No. 2; there are very few reducers to equal it in this direction.

The method adopted by Mr. Wild I would strongly recommend for the development of all night negatives taken at exposures less than three minutes, but certainly not when the exposures are longer than this. Very short exposures at night do not give sufficient time for extreme over-exposure of the high-lights and consequent halation. This method, too, is decidedly the best for the development of panchromatic or colour-sensitive plates that will not stand prolonged development. Mr. Wild used the Imperial Standard formula made up with one part No. 1 to two parts No. 2, *and one part of hot water* to bring the temperature up to 75°. To prevent frilling all dishes, rinsing water, and hypo should be brought to about the same temperature.

To develop the plate, the gelatine surface of which should not be fingered, it is placed in a perfectly clean white dish, film up, and flooded with the diluted developer; it is then covered up, and rocked well to free from air bubbles. After having been in the developer for a few moments the plate is removed, and either placed in a large dish with cold water, or put, film up, under a running tap, and held there whilst the backing is removed with a tuft of cotton-wool. The light should be turned down as much as possible without inconvenience, to prevent any chance of fog. Unequal development would take place due to draining off of the developer if we were to remove the backing without keeping the film flooded with water. Some photographers develop their backed plates without troubling to remove the backing until after development. This method is all right for quick, straightforward development, but I do not recommend it for night work, as it interferes with the judgment of density, and may be the means of introducing numerous pinholes in the negative.

After the backing has been removed the plate and dish should be well rinsed and then flooded with fresh developer sufficient to cover the plate about one inch deep. It is then covered up, and may be safely left *without continuous rocking for ten minutes*, a slight rock being given at odd intervals. *Never examine the plate* by *transmitted* light; always look at it by reflected light *as it lies in the dish* (see reproduction of a night negative in last week's British Journal, p. 486), and before renewing the developer, which should be done every ten minutes, thoroughly rinse off the old stuff. To one not accustomed to the appearance of a night negative, it may be somewhat disconcerting to find next to nothing on the plate after twenty minutes' development; *but we must remember that our view is a night one, therefore the shadows will largely predominate and shadows in a negative are almost clear glass.* Do not examine the plate too much during development; I never look at mine until well over ten minutes. It is perfectly safe to leave it; the developer is weak, and cannot do any harm.

Robert Dykes, F.R.P.S.

(To be continued.)

MAPPING FROM AIR PHOTOGRAPHS.

From the purely photographic standpoint the war-created art or craft of aerial photography can too easily be regarded as having been brought to a high pitch of perfection. It is quite true that by the combined efforts of opticians, camera constructors, and emulsion makers the obstacles which sheer height, the movement of the aeroplane or atmospheric conditions put in the way of obtaining well-defined negatives from the air have been almost completely overcome. Yet that, after all, is only half the battle. An aerial photograph is nothing except in so far as it fulfils a useful purpose. In the important work of map-making the following paper by Lieutenant-Colonel M. N. MacLeod before the Royal Geographical Society is a timely reminder, by an authority, of the distance the aero-photographic method has still to traverse before it can dispense with the surveyor to supplement or check its results. To anticipate Colonel MacLeod, a general conclusion to which he comes is that "for accurate work we cannot of course dispense with the surveyor altogether, and in hilly country, until we can devise some satisfactory form of stereo-plotter, the air photograph will not help us very much." Other geographers who discussed the paper shared this view, that aero-photo survey is a branch demanding further research, and that, more at the hands of surveyors and topographers than at those experienced in the purely photographic problems. Such an expression of opinion is not without its significance in reference to the ideas of photographic survey apparently held by the Royal Air Force, to which we devoted some attention last week, and which is further, though differently, emphasised by a letter in reply which appears on another page of this issue.—Eds. "B.J."]

Amongst the many innovations which the war has produced not the least interesting and important are the methods of survey and mapping which were introduced and developed in France to meet the needs of the fighting troops for accurate large-scale maps. These needs were consequent on the peculiar character of the fighting, and were not foreseen before the war. That they could be met at all was due to the aeroplane photograph, which was developed and exploited to such an extent that it is no exaggeration to say that the aeroplane camera became the strongest weapon of the "Intelligence" Staff and the topographer. Regarded thus, the aeroplane photograph can be considered in two aspects, one purely "Intelligence" and the other topographical. From the strictly intelligence point of view its primary function is to show what is on the ground at any moment, so that the intelligence officer, by studying successive photographs and thus watching the enemy's organisations, their nature, change, and development, is enabled to detect and forecast his military plan. Viewed from this standpoint, the "interpretation" of air photographs becomes of prime importance, and has become in itself a special study of great interest. From the topographical aspect, however, the function of the air photograph is not to show primarily *what* an object is, but to show *where* it is, and enable us to place it in its correct position on the map. It is with this latter aspect that I have been principally concerned and propose to speak; the two subjects, however, cannot be entirely separated, and the map-maker must, of course, always devote considerable attention, at any rate in war, to the correct interpretation of the photographs he uses. In point of actual fact, I think I am correct in saying that the interpretation of photographs as a special study followed some time after their application to mapping, and followed upon the elaborate organisation of "camouflage" by both sides. At first, that is in 1915 and 1916, little organised effort was devoted to concealment from the air, the interpretation of photographs was comparatively simple, and their study was directed almost exclusively to correcting our maps and plotting thereon the enemy's and our own trenches and other defensive works.

As stated above, the need for large-scale maps had not been foreseen before the war, consequently the first aeroplane photographs, taken early in 1915, found us without any proper organisation for making use of them. Attempts were made by the Intelligence Branch of the General Staff to correct the then very imperfect maps from them; but without success, for the reason that, though the photographs showed all the principal topographical features in great detail, there was no means of determining their exact scale or the amount of distortion due to the camera not being truly vertical at the moment of exposure of the plate.

This difficulty can be overcome in two ways: one by the invention of mechanical devices for measuring the tilt of the camera and its height at the moment of exposure, and the other by determining on the ground the correct positions of a sufficient number of points which can be identified on the photographs and deducing the scale and distortion of each photograph by comparing the relative positions of such fixed points as appear on it with their true relative positions as fixed on the ground. In France we devoted little attention to the first, and all the methods of plotting we used postulated a sufficient number of fixed points, determined on the ground, or by some independent means, which formed the framework of the map. How this framework was provided has already been described to the Royal Geographical Society by Colonel Winterbotham, and I will not, therefore, say much about it. The enemy, however, I think, almost certainly employed some mechanical device for measuring the amount of tilt. They also, I think, mark on their photographs the focal length of the lens used and the height at which the photograph was taken. I do not, however, know anything about these devices, and must, therefore, confine

myself to describing the methods of plotting used by ourselves and the French, and such German methods as have come to our knowledge from captured documents.

On any air photograph of a country like France or England the most conspicuous features are the roads, railways, and rivers; consequently, to plot a photograph by comparison with a framework, it is best that the framework should be formed of these features. In France this framework was provided either from the "Cadastre" or by a plane-table survey (when possible) of all the principal cross-roads, sometimes by a combination of the two. This framework was drawn out on a sheet of paper known as the "compilation diagram," and the first method of plotting used by us to fill in the detail depended on the fixation of a number of additional points by a system of prolongations and alignments depending on the principle of perspective that straight lines on the ground remain straight lines on the photograph, and on the use of proportional dividers for filling in the intervening detail. Corresponding points on the diagram and the photograph having been selected, the dividers were set by trial and error so that one end gave the distance between two points on the photograph, and the other end gave the distance between the same two on the diagram. The detail round them was then plotted point by point by measurement from these two fixed points, checked, if possible, from a third.

This method was naturally very laborious and slow, and was only accurate when the photograph was taken truly vertical, and the scale therefore uniform all over. This was rarely the case, and it was often necessary to plot as many points as possible from several photographs to find "mean" positions, and regard these as "ruling" points before proceeding with the plotting of the others. The results, when time permitted, were more satisfactory than one might have expected, but the process was slow, and it was not long before efforts were made to devise something better.

The next development was the use of the "camera lucida" to project the image of the photograph down on to an adjustable board carrying a tracing of the map framework, which could then be swung about until the "fixed" points on the photograph coincided with those on the map framework, when the draughtsman could draw in anything on the photograph by running over the lines with a pencil. This method was, and is still, I believe, largely used by the French, who used an apparatus known as the "chambre claire," consisting of a prism mounted over a board carried on a universal joint, the whole being carried on a horizontal slide at the other end of which is a vertical board to which the photograph is pinned. The photograph board can be moved backwards and forwards along the slide by a screw worked from the draughtsman's end.

This arrangement was tried by us, but was not found very satisfactory. The strain on the eye is very great, there is considerable parallax, and the adjustment is not very easy, particularly if the draftsman does not thoroughly understand the principles of focus and perspective on which the correct adjustment is based. The photographs, moreover, require treatment before they can be used, or the image on the paper is not sufficiently clear. The French commonly scraped out the roads on the photographs to make them appear bright white, and inked up the trenches in red and blue. I do not like the instrument, at any rate our instrument, for mapping work, as the strain on the eye is so great that the draftsman is often tempted to trace in only a few features and sketch in the rest by eye.

The next apparatus evolved was a cumbrous affair called a "projectograph," constructed by the British. In this the image of the photograph was projected by means of a lens and prism down on to a board similarly mounted horizontally on a universal joint, the arrangement being generally similar to the "chambre claire" of the French, except that the small prism of the "camera lucida" to which the eye is placed was replaced by a lens and a prism which could be focussed to give an image on the board. The apparatus was extraordinarily cumbrous, and suffered from the defect that the vertical photograph board could not be adjusted by the draftsman without moving away from the end where he could see the image. The whole also had to be enclosed in a black shroud to keep out the light. Each field survey battalion was supplied with one of these outfits. I eventually made good use of mine, but only after disintegrating it into its component parts.

In both this and the "chambre claire" I always found great difficulty in adjusting the photograph and the "map" so that the image of the two coincided all over the photograph. The reason may have been that we had not a lens of the proper focal length, a point to which I will refer again later. In any case, it was this difficulty which was the deciding factor in leading us on to the apparatus we eventually constructed, which involved the use of an enlarging camera, and for which many parts of the dismembered "projectograph" came in very useful. Having first prepared the "compilation diagram," the photograph was compared with it and the points common to both, usually cross-roads, but sometimes churches or buildings, were marked on the photograph. The negative was then borrowed from the R.A.F., these points marked on the back of it, and joined up with fine black lines. From the compilation diagram a trace was made of the corresponding figure. The negative was then put into the camera, and the image thrown on to a copying board mounted vertically on a universal joint. By moving the board backwards and forwards and twisting it about, the image was adjusted to fit the diagram as closely as possible. Provided the photograph was somewhere near the vertical, as most of those which we used for mapping were, the adjustment was not very difficult. A piece of sensitised paper was then pinned on the board and a print taken. From this print the map detail was traced on to the fair drawing.

To adjust the image correctly, at least four fixed points are necessary on each photograph, and these should be of course in the same plane or as nearly so as possible. No adjustment in a camera will correct distortion due to difference of level on the earth's surface. No amount of juggling with the negative or the board, for example, will make a vertical wall, photographed from an angle and appearing as a narrow oblong on the negative, appear as a Euclidean line on the final print.

The adjustment of the image also depends on the focal length of the lens used in the enlarging lantern.

For correct adjustment the focal length (g) required is given by the equation

$$g = \frac{tf}{p+t} \text{ (assuming that the lens is correctly centred)}$$

where f = the focal length of the aeroplane camera,
p is the scale of the negative,
t is the scale of the map.

It will be seen that when p and t are equal, the focal length of the lens used in the enlarging lantern should be half that of the aeroplane camera lens.

In practice it is not possible to use a different lens for every variation of p and f, and it can be shown that correct adjustment can be obtained with a lens of any focal length by using a "rising front" in the enlarging lantern and displacing the lens a certain distance from the perpendicular to the centre of negative.[1]

The proof of this is rather too long to give here, as are the calculations giving the amount of this displacement and the inclination which must be given to the copying board.

The latter is given by the equation

$$\sin \phi = \frac{g(p+t)}{ft} \sin \theta$$

where ϕ is the inclination of the copying board to the vertical, the projection of the horizontal line through the centre of the aeroplane photograph being taken as axis, and θ is the inclination of the negative to the horizontal (*i.e.*, the tilt).

The displacement, which must be in a direction at right angles to this same axis, is given by the equation

$$d = \left(g.\frac{p+t}{t} - f\right) \tan \frac{\phi + \theta}{2}$$

When θ is small (less than 4°), and p and t are nearly equal, then, if we use in the enlarging lantern a lens of the same focal length as that of the aeroplane camera, we have

$$\phi = 2\theta \text{ and } d = f \tan \frac{3\theta}{2}$$

[1] Commandant Roussilhe, of the French Army, has constructed an enlarging camera which is said to give a correct projection and exact focus, but the preliminary calculations and adjustments are said to take four hours for each photograph. When adjusted, however, it can be used for photographs taken at any angle.

Or, to take a concrete example, if $\theta = 4°$

$$\phi = 8° \text{ and } d = \frac{f}{10} \text{ nearly.}$$

The final print is rarely clear enough to trace directly on to the fair drawing, and it is generally necessary to ink up such features as have to appear on the map in vermilion, or other suitable colour. This, however, does not take long, and can be done by comparatively unskilled men.

This method proved far the quickest of any we used, and also the most accurate. It has the further very great advantage that every feature, however small, visible on the photograph can be drawn in without difficulty on the map correctly to scale in its correct position. It is, for example, perfectly easy to draw in every individual tree in an orchard or along a road exactly in its correct position. The print is also a permanent record which can be filed with the other mapping material for future reference, if required.

Used in this way the air photograph can hardly be improved on as a means of making large-scale maps. In 1918, after we got this apparatus into satisfactory working order, my Battalion mapped more than twenty 1/10,000 sheets, each 8,750 by 5,500 yards, in three months, employing about six topographers and twenty draftsmen on the work; or about five square miles per man per month. This included the plotting of the grid and trig. points, preparation of the compilation diagram, plotting of the photographs, and the fair drawing of detail, water, and contours on separate plates: the whole process of survey, except the triangulation, typing of names, and the reproduction.

This map was never systematically checked, but the tests applied to our maps in the field were pretty exacting, and no serious errors were detected. I am confident that in flat country, particularly in close, well-wooded country such as in the region round Hazebrouck to which the above figures refer, mapping from air photographs in this way is incomparably quicker and just as accurate as any other method of survey at present known to us.

M. N. MacLeod, D.S.O., Lieut.-Col., R.E.

(To be continued.)

DEATH OF MR. HENRY A. STRONG.

The death is announced of Mr. Henry A. Strong, vice-president of the Eastman Kodak Company, on July 26 last, at the age of eighty-one.

Mr. Strong was the oldest business associate of Mr. George Eastman in the development of the enterprise which has grown to its present world-wide dimensions. In 1881 Mr. Eastman had newly left the service of the Rochester Savings Bank, and was beginning the manufacture of dry-plates in quite a small way. He needed more capital, which Mr. Strong, the senior member in a Rochester whip business of Strong and Hanbury, supplied on the terms of a half-share in the dry plate business, which was organised as the Eastman Dry Plate Company, Strong and Eastman, proprietors. This early association has been maintained throughout the evolution of the Eastman undertakings, and at the time of his death Mr. Strong, so it is stated, was the second largest stockholder in the Eastman Kodak Company.

FORTHCOMING EXHIBITIONS.

September 13 to October 11.—London Salon of Photography. Entries close September 2. Hon. sec., 5a, Pall Mall East, London, W.C.1.

October 13 to November 29.—Royal Photographic Society.—Entries close September 19 (carrier), September 20 (hand). Secretary, J. McIntosh, 35, Russell Square, W.C.1.

Rajo Paper.—Messrs. Rajor, Ltd., intimate that they have made improvements in the emulsion of their "Rajo" developing whereby an increased latitude and lengthened scale of gradation enable them to dispense with the three grades, vigorous, soft, and normal, and to issue the paper in one grade only, suitable for all classes of negatives.

Assistants' Notes.

Notes by assistants suitable for this column will be considered and paid for on the first of the month following publication.

Fitting-up the Retouching Desk.

Autumn will soon be here, and when the clocks go back next month we shall realise it all at once, for it will be dark quite early, and retouchers will have to overhaul their arrangements for working by artificial light.

The makers of retouching desks seem to have paid little or no attention to this matter, with the result that retouchers themselves have to attend to it, as the desks are only arranged for daylight.

It is really an important matter, as it affects the eyesight of the retoucher considerably, a bad or badly arranged light soon compelling the use of glasses to ease the eyestrain, particularly where electric light is used.

A good oil lamp is usually considered the best artificial light to work by, but it is not always obtainable, and is also messy to clean and look after—both are items which waste the retoucher's valuable time. Moreover, retouchers usually seem to be expected to take the light provided and make the best of it, though this action on the part of the employer is not wise, for an arrangement quite comfortable for one retoucher is quite the reverse for another. For this reason I am going to suggest an arrangement which I myself use and find quite comfortable.

It is, of course, necessary to be as economical with light as possible even this winter, as we are still rationed, both for gas and electric light, and therefore where possible a lower powered bulb or mantle may be used nearer to the working aperture by the means I shall describe. This consists of three or four slots, with glasses, etc., running in them and working right on the desk itself.

The slots can be made from strips of three-ply wood, Academy board, or Winsor and Newton's Birchmore board. The strips are cut about two inches wide, and say nine inches long—depending, of course, on the size of the desk-opening. First a wide strip is fitted, then two narrower ones, half an inch above the edge of the wide one, then another wide strip, and then two more narrow ones.

All these strips are laid upon each other in a pile, till the required number of slots are formed for the glasses to run in. These are then carefully nailed all together, the nails being hammered over at the points so that the whole is held quite firmly together.

Next take first a piece of opal, half or whole plate size, according to the size of the opening in the desk—I have found half-plate to be quite large enough myself—next a piece of ground glass, or, failing it, a clean half-plate glass matt varnished over and covered with a clean cover glass, "passe-partouted" to it lantern-slide fashion, to protect the varnished side.

Now fix and wash a couple of unexposed negatives of the required size, and before drying immerse for a minute or two in water coloured to a faint bluey-green with a few drops of the blue stain of the Vanguard Co. Very little colour is needed, but just make a pale glass, and then double the strength of the solution and make a more deeply stained one. These should then be dried, covered, and bound as was the matt-varnished glass.

The strips forming the slots should now be nailed or screwed on to the back of the retouching desk, at such a distance apart that the various glasses can be pushed easily to and fro with a touch of the finger or by the use of cords.

Where an electric bulb is used it can be hung on a flex, from a hook in the top back edge of the desk, a strip of wood with a V-shaped notch in the end screwed on the edge next the hook serving to hold the bulb out clear of the glasses, and yet near enough to save any waste of light. An inverted incandescent gas mantle can be used in the same way, but an upright one must be fixed to a stand or a high block of wood, to bring the light to the right height for comfort and convenience. For electric light I use the opal and one of the blue glasses together, the blue killing the yellowness of the light and making it approximately the same to work by as daylight—a soft, steady light. For incandescent gas I find the ground glass and pale blue glass will answer

well, being, of course, drawn over the opening in the desk against which the head to be retouched comes.

Even for daylight work I often find the ground glass a great convenience, where a very thin negative has to be retouched, making it easier to see the subtleties of half-tone and shadow, and all or any of the glasses can be instantly adjusted with one hand, without moving from one's seat and losing the focus of the eyes on the negative.

A little swing shelf, fastened to the side of the table and supported by a steel rod is also most useful to hold bottles, medium, etc., as it can easily be pushed out of the way, and the drawers fitted to most retouching desks are quite inadequate to hold bottles, and medium upset over the clothes has a tendency to ruin the clothes and cause much profanity. I also save the powdered lead from the retouching pencil, and find it makes an excellent stumping chalk, quite free from grit and of a good black.—G. E. H. G.

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Applications for patents, August 11 to 16.

CAMERA ATTACHMENT.—No. 20,159. Camera attachment. M. W. Beyer.

PRINTING.—No. 20,071. Photographic printing apparatus. J. E. Bramwell.

FOCUSSING.—No. 19,847. Focussing devices for photographic cameras. W. Graham Brown.

CINEMATOGRAPHY.—No. 20,122. Cinematograph machines. A. La Rocca.

LANTERN-SLIDES.—No. 20,221. Photographic lantern-slides. W. J. Rider.

FILMS.—No. 20,084. Process for preparation of photographs or cinema films. G. Scelsi.

COMPLETE SPECIFICATIONS ACCEPTED.

These specifications are obtainable, price 6d. each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

AERIAL CAMERAS.—No. 128,609. (January 3, 1917.) A camera for taking a series of photographs from aircraft has an intermittently-operating motor for operating the film-feeding mechanism and the shutter, and timing-mechanism for starting the motor at regular intervals. The timing-mechanism is regulated by means operable from the pilot's seat. The motor for operating the film feed and shutters comprises four spring drums J^1 . . J^4, fig. 6, the drum J^1 carrying a spur-wheel j^{14} for driving the film mechanism and a second spur-wheel j^{15} engaging the

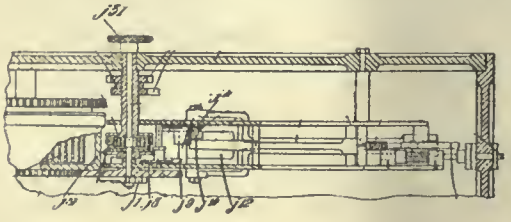


Fig. 2.

spur-wheel j^1, fig. 2, of the timing-mechanism, by which the tension of the spring j^{19} is maintained. The film-winding mechanism comprises spur-wheels M, F, fig. 5, which drive the winding-roll F through a friction clutch F^2, F^3, fig. 6. Engaging with the pinion F^1 is a spur-wheel L^1 engaging gearing M^2, E^1 which drives a measuring drum E for measuring the required amount of film for each exposure, and also drives the roller blind mechanism. The spur-wheel L^1 carries on its axle ratchet-wheels L which are released in turn by pawls k^2, the timing of which is controlled by the timing-gear. The timing-gear comprises a spring drum j^{19} wound by means of a handle j^{31} and driving an escapement-wheel j^8 engaged by an anchor escapement j^9 attached to an adjustable pendulum j^{11}, j^{12}. The axle of the spring drum j^{19} carrier cams j^{20} which engage the levers K by which the pawls K^2 are moved. In the form shown in figs. 2 and 5, the adjustable pendulum comprises a lever j^{11}

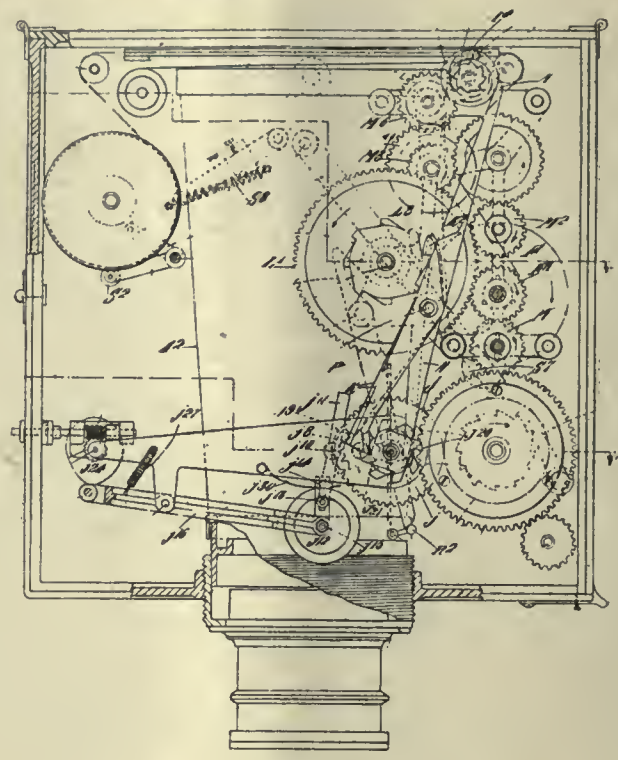


Fig. 5.

carrying a pin j^{13} engaging a slot in the heavy disc j^{12} mounted on the pivoted arm j^{16}. The timing is regulated by altering the distance of the disc j^{12} from the lever j^{11} by means of a

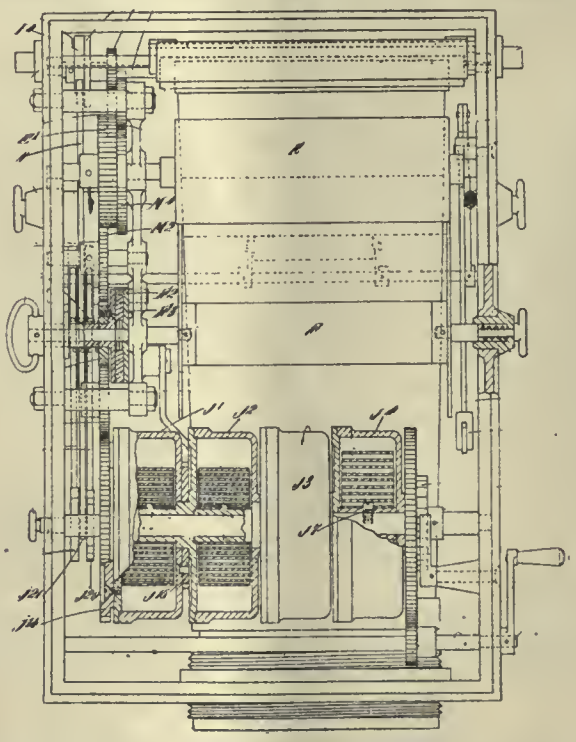


Fig. 6.

cam j^{24} operated by a worm and worm-wheel. The worm may be rotated through a flexible shaft by means of a handle on the aeroplane. In the form shown in fig. 10, the adjustable pendulum comprises a lever j^{110} a slot in which engages a pin

carried by the lever j^{120} carrying weights j^{122}, the position of which is varied by means of a right and left handed screw j^{124}. The shutter arrangement comprises a roller-blind shutter G moving in the focal plane and a safety shutter R opened immediately before and closed immediately after an exposure is made. The roller-blind shutter is wound up by means of gearing M^2, E^1, M^3 . . M^8 from the spur-wheel L, and is held against return by means of a ratchet-wheel and pawl I^4. When sufficient film is wound and the shutter set, the cam j^{21} on the

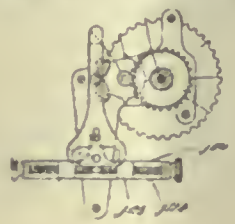
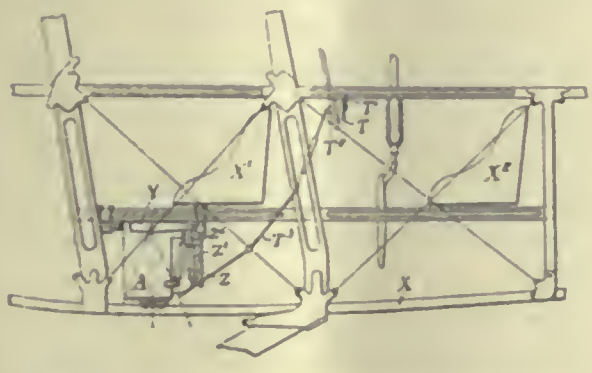


Fig. 10.

timing-gear engages the lever N, which trips the pawl I^4 and releases the shutter. Immediately before the release of the shutter G, the safety shutter R is opened by means of a cam L^3 engaging a lever R bearing against the short lever R^2. For use on aircraft, the apparatus is suspended in gimbals provided with dash-pots as described in Patent No. 128,593. In order to prevent the winding of the film from the supply to the take-up spool from disturbing the centre of gravity of the apparatus, the counterweight S^7, fig. 9 (See Patent No. 128,593), is mounted on a lever S^3 connected through link-work to a roller S^2 kept in contact with the film on the roll C by a spring S^8.—Arthur Brock, Junr., 131, South Fourth Street, Philadelphia, U.S.A.

Aerial Cameras.—No. 128,593. (January 3, 1917). A camera for

Fig. 1.



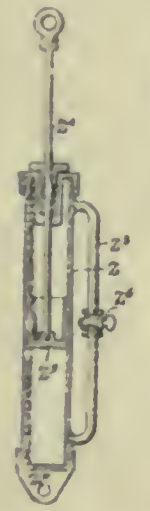


Fig. 4.

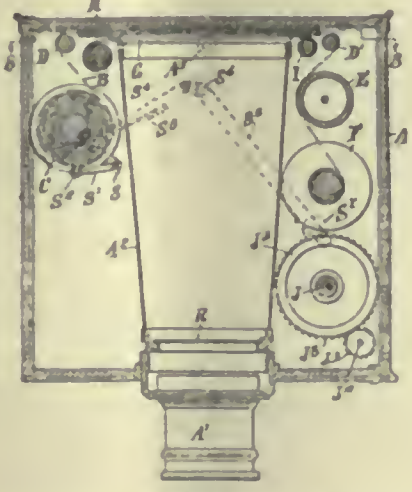


Fig. 9.

taking a series of overlapping photographs from aircraft is suspended by yielding damping-means so that its axis is maintained in the same direction in all positions of the aeroplane, and counterbalancing-means are provided to maintain the position of centre of gravity when the film is wound from one spool to the other. The camera A, fig. 1, is suspended by means of gimbals Y, dash-pots Z, Z^1 being provided between the camera and gimbal frame Y and between the gimbal frame Y and the framework X of the aeroplane respectively. The dash-pots comprise a cylinder Z, fig. 4, containing a piston Z^2 and provided with an adjustable by-pass Z^3. The film is positioned and exposures made by means of a spring motor, and the timing determined by adjustable clock-work as described in Specification 128,609. To prevent the winding of the film from the supply roll C, fig. 9, to the roll F from disturbing the position of the centre of gravity of the apparatus, a counterweight S^7 is mounted on a lever S^3 connected through link-work to a roller S^2 kept in contact with the film on the roll C by means of a spring S^8. The photographs obtained by this apparatus are utilised for plotting maps and determining the height and distances between different points, and also the height of the aircraft at which the photographs were taken.—Arthur Brock, Junr., 131, South Fourth Street, Philadelphia, U.S.A.

New Books.

Home and Garden Portraiture.—The latest issue of the "Photo-Miniature" to reach our table has for its subject the making of at-home and garden portraits, and is illustrated by a number of examples of the fine work of Mr. Charles H. Davis in this field. Those who have read Mr. Davis's two articles in recent issues of the "British Journal" will be glad to avail themselves of this opportunity of comparing his practice with his precepts, and will, we are sure, think all the more of both. The text of the "Photo-Miniature" deals comprehensively with the practical work of portraiture in ordinary rooms and amid the other surroundings of a home, and is full of advice on the choice of the camera and lens and on the all-important matter of lighting. Our little contemporary is now obtainable again from Messrs. Houghtone, Ltd., 88-89, High Holborn, London, W.C.2, price 1s. 6d.; in America, from Messrs. Tennant and Ward, 103, Park Avenue, New York, price 35 cents.

The Elements of Photography.—Mr. Frank R. Fraprie, editor of "American Photography," may be congratulated on having made a really welcome and useful addition to the numerous elementary text-books on photography. The little book, issued as "The Elements of Photography," is not an instruction manual of the ordinary kind, but a concise and rapid review, written in a way which the photographically inexperienced can understand, of the things which are current knowledge among photographers. It is a book which can be put into the hands of anyone anxious to take up photography and uncertain of the best way to go about it. Those who take it as their guide will have a very good general acquaintance with the processes which photographers use, and will save themselves from having to admit, after perhaps a year or two's experience, that they had never heard of such a process as factorial development or of the use of the rising front. Yet all of us who have had occasion to render assistance to the photographic tyro know that his extraordinarily small and promiscuous reading leaves him in ignorance of many of the things which he ought to know. "The Elements of Photography" provides as well as can be done a preliminary and sufficiently detailed presentation of photographic practice. It is issued from the office of "American Photography," 221, Columbus Avenue, Boston, U.S.A., price 35 cents in paper, 75 cents cloth bound.

Blackpool Beach Photography.—A raid upon photograph-sellers on Blackpool sands had a sequel at the police-court on August 22, when nine young men were fined for infringing the bye-laws by selling photographs within a forbidden distance of the Promenade. The acting chief constable said it was not fair such men should come into the town and do what they were doing in summer time. He asked for salutary penalties. Fines of 40s. each were imposed on Israil Kwasneck, A. Cohen, Leonard Smith, Alex. Forley, Arthur Attenbury, Robt. Dwyer, Dorothy Dwyer, and Harry Mackson. Cohen was fined 40s. in each of two cases. The magistrates also prohibit the taking of photographs on the sands or of bathing parties.

New Apparatus, &c.

The Ensign-Duplex Safelight Lamp. Sold by Houghton's, Ltd., 88-89, High Holborn, London, W.C. 1.

A very workmanlike lamp for the dark-room and one embodying a new feature of design has just been introduced by Messrs. Houghton, primarily for the use of professional photographers. Novelty and practical usefulness are qualities which do not always go hand in hand. We should be reluctant to accord praise to an article of use merely on the ground of some novel element of design, for we have seen too many examples, among photographic requisites, of the desire for "something new" leading unmistakably to the sacrifice of utility in practice. But in the "Ensign-Duplex" lamp the novel element is a distinctly useful feature which adds to the comfort and efficiency of the lamp in ordinary dark-room work. It consists in providing a safe light in the flat top of the lamp as well as in the sloping front. The illumination cast upwards from the top of the lamp thus renders visible the contents of shelving, against and below which a lamp stands as a rule, and thus rescues the bottles of stock solution, graduates, and the like from the pro-

found gloom in which usually they are plunged. Moreover, by reflection of the light from the walls and ceiling, the dark-room obtains a low general illumination which, in the case of a small room, may extend to every corner, and in any case greatly contributes to comfort of working.

In addition to this feature special to it, the new lamp is of excellent design. It is of ample size, measuring inside about 10 x 10 x 12 ins., and the upper part of its sloping front accommodates the electric lamp in a position where no direct rays are emitted through the front or top safelight, but instead a very even flood of illumination by reflection from the matt white walls of the lamp. The safelights are transparent, as they quite well may be in so well a designed lamp. They are obtainable in five varieties: yellow, for gaslight papers; light and deep orange, for bromide papers and slow plates; red, for rapid plates; and green, for panchromatics. Two safelights are included with the lamp, at the price of £1 18s. 6d., together with 9 ft. of electric cable. Extra safelights are supplied at 5s. 6d. each.

A Boot Accessory.—Taking their cue, no doubt, from the nursery rhyme of the "Old Woman Who Lived in a Shoe," the Pytram Manufacturing Company, Dunbar Road, New Malden, Surrey, have introduced, as a studio accessory for photographers, a papier mâché boot of length about 32 ins., and thus big enough to allow of a fair-size child sitting in it. No doubt there are numbers of mothers whose artistic taste is such that they would be attracted by a portrait of a baby in these novel surroundings. We can well believe that it is so, for do we not remember a postcard, which had a large sale and led to litigation, in which a popular actress was shown emerging from an egg. The unusual will always secure popularity simply on the score of its novelty, and we can certainly say that the Pytram Company has imparted a high degree of realism to this boot accessory of theirs. It is an old boot, with the uppers very much creased and the toe dented in, all of which heightens the effect when a pretty child of two or three years is seated in it to have his or her photograph taken. The accessory is supplied at the price of 30s.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Tuesday, September 2.

Hackney Photographic Society. Lecture. H. W. Bennett.

Wednesday, September 3.

North Middlesex Photographic Society. "Combination Printing." H. W. Fincham.

Thursday, September 4.

Rodley and District Photographic Society. Monthly Competition: "Holiday Pictures."

Hammersmith Hampshire House Photographic Society. Monthly Competition. Genre Subject.

CROYDON CAMERA CLUB.

Last week Mr. A. E. Isaac, an original member of the club, who never looks any older, gave a very practical evening on "Gas Fitting," one unsuited for detailed notice in the absence of diagrams. The majority will wisely leave this business to the accredited professional, as the laying and joining of iron gas-pipes calls for tools in these days costing much good money. On the other hand, compo' pipes are far easier to tackle, do not require expensive tools, and when hidden by plaster readily absorb any nails driven into the walls.

The catalogue sizes of gas pipes are rather astonishing to the uninitiated. To take one instance from many examples:—A "$\frac{3}{8}$-in." brass tube is equivalent to a "$\frac{1}{8}$-in." iron pipe, and both will screw into the same socket. Outside diameters in the one case, and inside in the other, explains this, but does not account for the fact that stated and actual sizes are often not in accordance.

Among other feats only possible to an expert, Mr. Isaac soldered two compo' pipes together in little less than no time. This led Mr. Harpur to try his hand, and for half-an-hour or so he wrestled with the problem, largely employing the blowpipe as a self-ejecting spittoon. Finally, an irregular mass of solder collected round the alleged join, upon which he triumphantly seized a piece of cotton-waste and dexterously wiped the pipes apart again. A most hearty vote of thanks was accorded to him and to the demonstrator.

The versatile nature of the informal session was again illustrated the previous week, when Mr. Sidney Tatchell, R.I.B.A., gave a highly interesting lecture on map-making, recalling infant days when the drawing of maps was welcomed as an escape from depressing instruction, particularly when the sporting element entered with configurations from memory. In point of originality these put to shame the finest ordnance productions.

From the lecturer's remarks it became apparent to all that not only is map-making a truly scientific pursuit, but accurate and rapid map reading is by no means so easy as some might suppose. To all intents and purposes it may be said that an expert ordnance map reader can clearly visualise the region the map represents, even to determining from any standpoint whether the visibility of distant hills is eclipsed by nearer elevations.

It is not possible to deal with the many useful points discussed, the most important tip, possibly, being that the letters "P. H." in ordnance maps indicate a source of great comfort to weary pilgrims, provided "P. H." is not closed, or run out of beer. Various maps from half an inch to 25 inches to the mile were shown, also a wonderful built-up model of a landscape; the full scale map which accompanied it showed clearly the principles involved in map making. The one inch to the mile ordnance maps, he said, will be found the most generally useful. It is to be noted that unless shown to the contrary all maps are drawn north and south, and in the smaller ones footpaths indicated are not necessarily rights of way.

In the discussion, Mr. Witterick first gave tongue, for in some

mysterious manner a map on the wall had been quietly but persistently insulting his intelligence, judging from his injured air and expostulations at the end of the lecture. Mr. Sellors had not quite grasped "contour lines," and asked many questions with apologies for his stupidity. "No apologies are necessary if one is born that way," politely remarked the "office boy," ever anxious to stand well with the powers that be. "Fancy a push-bike secretary not understanding contours!" supplemented Mr. Harper in pained astonishment. He then authoritatively learned, with no apparent satisfaction, that the graceful contours and majestic undulations abounding in his person could be expressed in map form, this information being elucidated by another question of the secretary. Mr. Clemes said that once in France, when steering by map and compass, owing to no allowance having been made for the difference between the magnetic and true north, a party, of which he was a member, missed the rendezvous by miles. The particular canteen aimed at was not mentioned. A most hearty vote of thanks was accorded to the lecturer for an evening of unusual interest.

Commercial & Legal Intelligence.

Eastman Kodak Company.—The usual quarterly dividends of 1½ per cent (being at the rate of 6 per cent. per annum) upon the outstanding preferred stock, and of 2½ per cent. (being at the rate of 10 per cent. per annum) upon the outstanding common stock, will be paid on October 1 to stockholders of record at the close of business on August 30.

Legal Notices.—A supplemental dividend of 6s. 8¾d. in the £ has been declared in the bankrupt estate of Alfred Ernest Priest, photographer, 21a, Prince of Wales Road, Norwich, and residing at 51, Sprowston Road, Norwich. This dividend is obtainable at the Official Receiver's Office, 8, Upper King Street, Norwich.

NEW COMPANIES.

Egertons, Limited.—Registered on August 16, with a capital of £20,000 in £1 shares. Objects: To carry on the business of photographers, dealers in photographic and other films, photographic printers and publishers, dealers in cinematograph machines and films, etc. The subscribers (each with one share) are:—B. A. Gale, Glentwood, Hale, photographer, and A. D. Monloud, 93, Market Street, Manchester. B. A. Gale signs as "director and manager." Registered office:—45-49, Oxford Road, Manchester. Private company.

Guild of Illustrators, Limited.—Registered on August 16 with a capital of £500 in £1 shares. Objects: To produce, reproduce, publish and deal in drawings, designs, prints, maps, photos, cinematograph films, lantern slides, microscopic sections, slides, and illustrations, to act as agents for artists and others, etc. The subscribers (each with one share) are:—P. J. Ashton, 157, King Henry's Road, Hampstead, N.W.; R. Durham, 61, The Avenue, West Ealing, W.13; J. O. Parker, 10, Blenheim Park Road, S. Croydon; H. H. Poole, 66, Burnley Road, N.W.10; W. Webb, The Hermitage, W.7. First directors to be appointed by the subscribers. Solicitor: P. J. Ashton, 83, Avenue Chambers, Vernon Place, London. Private company.

News and Notes.

The London Salon.—Intending exhibitors may be reminded that Tuesday next, September 2, is the last day for the receipt of entries for the forthcoming exhibition of the London Salon of Photography at 5a, Pall Mall East, London, S.W. Exhibits require to be delivered on this day by hand.

Mr. G. R. Ballance, famous for his landscape photographs of Switzerland and Italy, intimates that he is closing the business which he has temporarily carried on at 34, Birchwood Avenue, Muswell Hill, London, N.10. A permanent studio and works will be opened early in October at Mentone, A.M., France.

The Sunic Record, Messrs. Watson's organ of X-ray technics, publishes in its July issue some interesting notes on the industrial uses of X-rays, gleaned from the recent conference on the subject. It predicts a much wider scope for X-ray operators, particularly those of real photographic experience, by employment in this field. The "Sunic Record" may be obtained on application to Messrs. Watson and Sons (Electro-Medical), Limited, Sunic House, Parker Street, Kingsway, London, W.C.2.

Rapid Half-Tone Block-Making.—The "Times" reports that M. Georges Koister, the art editor of the Paris newspaper "Le Matin," who is on a visit to London, expressed a desire to know exactly how quickly the "Daily Mail" could take a photograph and make a block of it for reproduction. The length of time mentioned by the art editor seemed almost incredible to M. Koister, and there was a sporting interest in the performance which followed. M. Koister and a friend were photographed on the Embankment at 2.40 yesterday afternoon. At 2.54 a proof of the photograph was handed to them, and at 3.14 the block from which the newspaper reproductions are made was finished. The complete process thus took 34 minutes, and M. Koister described the performance as a record.

R.A.F. Photo Section.—In comment upon our notes of last week, the "Westminster Gazette" writes:—The British Journal of Photography makes a very proper protest against the suggestion that the photographic section of the Royal Air Force shall be retained in existence to carry out a photographic survey of these islands. What possible value can there be in such a survey of a country every landmark of which is carefully mapped? To suggest that such a survey might be useful in a war in which this country were invaded is silly. It would all have to be done again for war purposes, and done from day to day. Our contemporary puts the matter quite rightly when it says that all that the Air Force can require is a small staff of technical experts "to study the mechanical, optical, and photographic requirements of aerial photography for the naval and military services." That can be adequately done by a score of men, and the remainder of the photographic section ought to be promptly disbanded.

Correspondence.

**** Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

**** We do not undertake responsibility for the opinions expressed by our correspondents.*

A PHOTOGRAPHERS' CLUB FOR LIVERPOOL.

To the Editors.

Gentlemen,—Judging by recent letters in your columns, there is some chance of the long-belated photographers' union becoming a reality.

Although I am not an assistant, and such a union would be of no benefit to me, I must say that the sooner it comes the better, and I sincerely hope that want of enthusiasm and energy on the workers' part will not spoil the efforts of those who are trying to get them out of the rut.

For the last six months I have been hoping to inaugurate a photographers' club for Liverpool, but have made no headway owing to the dearth of premises. There is still a possibility of bringing it into being for the winter. If any interested photographer cares to address a post card to me at Hall and Ashton's Office, African Chambers, Liverpool, I shall be pleased. Such a

club might provide ways and means for mutual assistance which would be of value to Liverpool workers.—Yours sincerely,

J. RONSON HALL.

PREVENTING DOUBLE EXPOSURES: PRESERVING OX-GALL: SOFT FOCUS LENSES: CHARGES FOR BACKING.

To the Editors.

Gentlemen,—I have recently tried the following method of preventing double exposures, which, though it may not be original, I do not remember to have seen described: Insert a small piece of tough paper between the screw head and the notch in the spring of dark-slide shutter. It will fall out on the shutter being drawn, thus automatically indicating that the plate has been exposed.

Last week a correspondent inquired how to keep ox-gall. Ascertain your butcher's killing day, get a fresh gall bladder, and add, say, ¾ oz. undiluted formaline to the contents (about a pint). The instructions for its use are most ably given in No. 3083 of the "B.J."

There have been some recent queries *re* soft-focus lenses. Users of the *f*/6.5 Cooke lenses will find that diffusion can be obtained by unscrewing the front glass a little. It may not be generally known that by taking out the back glass of this lens and unscrewing the front glass to the maximum extent a useful long-focus lens is obtained. It must be stopped down to secure definition.

A fortnight ago a correspondent complained of profiteering in packing boards. Nobody seems to draw attention to the exorbitant charges made for backing plates. When it is taken into account that plates (unbacked) are sold at a handsome profit, is it not preposterous that 1s. 3d. should be charged for daubing less than a pennyworth of backing on a dozen half-plates?—Yours faithfully,

OLD HAND.

THE PHOTOGRAPHIC SECTION OF THE ROYAL AIR FORCE.

To the Editors.

Gentlemen,—On reading the article under the heading of "The Photographic Section of the Royal Air Force," in your issue of the 22nd inst., I must express a feeling of surprise, for I did not expect to find in your pages an article which is written in such a reactionary spirit and based upon an obvious ignorance of the present position of aerial photography. It is true that the "Times" report is perhaps slightly distorted owing to its brevity, but the ideas underlying your article are too fundamental to be based on a newspaper report. I should therefore like to deal with some of the points mentioned, and to endeavour to correct the impression which they undoubtedly convey.

It is stated at the outset that "it would appear that there is a desire on the part of those associated with the Photographic Section of the Royal Air Force to maintain that branch upon a considerable footing." This is, I know, not the case, and further, from an intimate knowledge of the officer who is now in charge of the aerial photography in the R.A.F., I feel that he is a man who has the courage to say when any movement is considered to be a waste on the part of a Government department. The statement that every town, river, etc., should be photographed was distinctly made as a suggestion for those ex-photographic officers who had the courage to embark upon this class of work as a commercial venture, and it was never suggested that the R.A.F. should undertake this work. To dwell upon this point, I would commend the writer to go to some popular seaside resort and to enquire if there is an inch of ground which has not been photographed from every angle and the results sold as picture postcards. To quote the remark of a publisher of such postcards from a place not 1,000 miles from Blackpool: "We have photographed the old place inside and out, and the only position now left is from an aeroplane." A project of this nature has recently been mentioned in the daily Press, and, as its promoter was present at the gathering of photographic officers, it is obvious that the speaker was trying to encourage similar undertakings, knowing that the men so employed would form an invaluable reserve should we again find ourselves at war.

At present the main object of the Photographic Section of the R.A.F. is undoubtedly the development of new methods and inventions and the maintenance of a nucleus around which an efficient force, similar to that recently demobilised, might be again built up if necessary. The present photographic staff of the R.A.F. undoubtedly know how this can be done, for they had a large share in building up the enormous establishment during the war which "accomplished a great work with triumphant success," not always owing to the organisation of the flying services, but often in spite of it. They are sufficiently conscious of the importance and possibilities of their work to resent being thought of merely as the producers of pretty pictures, applauded by the Press and the public, whose work is now finished and who may be appropriately frozen out in the restriction of expenditure. One of the greatest troubles during the war was that the work was done entirely on an emergency basis, and that emergencies foreseen by the photographic officers were unheeded by other branches of the staff till it was almost too late to act. The policy of wait-and-see advocated in your article of the 22nd is exactly what we had to fight against throughout, and which did so much to retard the progress of the work.

I can by no means agree with the statement that the function of the Photographic Section has been to state its problems and to leave their specific solution to manufacturers. Although I have no wish to slight their truly splendid efforts to maintain our supplies, yet I think that, were they consulted, they would agree that in a great many cases not only the problem, but valuable suggestions for its solution, came from the Air Force itself. It is certain that if this attitude had been adopted by the sections working in the East it would have resulted in disaster, for problems reported in the summer of 1917 had received little or no solution at home up to the time of the Armistice.

To turn now to that very popular but not unimportant subject, wasteful expenditure, I am sure that the tiny band of photographic officers now left in the R.A.F. would welcome a question in the House of Commons on the numbers of the personnel now employed compared with those at the date of the Armistice, on the present expenditure, and as to the views held by the Maps Department of the War Office and by official surveyors in India and the Near East on the utility of further aeroplane photography.

Everyone admits that an Air Force of a limited size has got to be maintained, and when aerial photographic survey is one of the few things of real and permanent value which can be undertaken by aeroplanes, a derogatory article purporting to have the authority of the *British Journal of Photography* is specially to be deplored. For, while the question of the proved applicability of aerial photography to the correction of maps is still under consideration in so far as it affects England, it has been abundantly demonstrated to be of the greatest value abroad. The photographic mapping of great Eastern cities like Baghdad, Lahore, and Peshawar has saved Government survey departments thousands of pounds and years of labour. The rapidity of work, the excellence of detail, and the degree of accuracy obtainable in the maps produced on scales of 1/40,000 and 1 in. to the mile, in Palestine and Mesopotamia, show beyond all question the value of employing all available aeroplanes in co-operation with ground surveyors. When one considers that Afghanistan and much of the Indian frontier remains to be mapped, and that frequent requests for photographic personnel are coming from those working in the East, it is scarcely correct to speak of the amount of photography still required in the field as insignificant.

The experimental stages in this work were passed through in 1917, since when several thousands of square miles of country have been photographically surveyed, and there is no need for any useless work to be carried out, if the lines already laid down are followed. At the same time, there is ample need for the improvement of both apparatus and methods, and for bringing aerial work into connection with the voluminous science of photogrammetry, about which so little is known in England. Little, if any, of this work in British possessions or spheres of influence can be or ought to be left to civilian firms, though I understand that a firm has been approached with a view to carrying out survey photography in China.

The American Government, with its characteristic aptitude for taking up valuable new discoveries, is, it is understood, inaugurating an Aeroplane Photographic Survey in conjunction with the U.S. Geological Survey, while Canadian Government surveyors, who have been using ground photography so successfully in the past, are anxious to see the utilisation of aerial photography in the Dominion. The photographic staff of the Air Force quite realises the possibilities and limitations of this branch of work, but should be encouraged rather than discouraged to make the best of it.

Finally, as the writer of your article was prompted to lay such emphasis on the point that no lists of surplus war material offered for sale by the Government include aerial photographic equipment, I attach a cutting from a recent issue of the "Times" which may be of interest. [See footnote.—Eds. "B.J."] I might further mention that one of two aerial photographic companies have been for some time using surplus stores supplied by the Disposal Board for aerial photography. If the writer is in need of aerial cameras, etc., he should write for the complete list from "The Surplus Government Property Disposals Board, Caxton House," Tothill Street, Westminster, S.W.

As one of the demobilised officers who listened to the speech which has given rise to these articles, I believe that I shall have the entire support of many of my friends, both among those remaining in the Force and from the majority, who have returned to civilian employment, in the above remarks. We should welcome any question in the House of Commons with regard to our occupation during the war, or as to the work which we commenced. Should there be among your readers anyone who shares my beliefs in the great future of this work, I hear that the Air Force is still anxious to obtain a few more recruits for its Photographic Section.

H. Hamshaw Thomas.

Downing College, Cambridge.

[We are exceedingly glad to have the assurance of Mr. Hamshaw Thomas that the programme of an aerial survey of this country is not contemplated by the Photographic Section of the R.A.F., but was a suggestion to civilian photographic bodies. The question of the advisability of such a programme can very well be left to these latter. We are in agreement also with what seems to be the view of Mr. Hamshaw Thomas, namely, that the work of the Photographic Section in the immediate future lies in the sphere of the survey of territory, although we cannot agree with him that the methods and principles of aerial photographic survey have been so completely worked out that there is not the opportunity for any useless work to be done along the lines so far developed. As recent discussion among ordnance surveyors has shown, there is still by no means approximately complete agreement as to the economic efficiency of the aero-photographic method, nor as to the extent to which it can usefully replace or supplement the existing methods of the surveyor. On this account it requires to be admitted that the decision as to the employment of aero-photographic methods should be left very largely with the branches of the Service entrusted with surveying work. We gather, from what Mr. Hamshaw Thomas tells us of the steps which are being taken by the Government authorities in the United States and in Canada, that it is intended to have such aero-photography carried out under the supervision of surveying departments—plainly, the desirable course. The paragraph from the "Times" which is referred to by our correspondent reached us just after our issue of the 22nd had gone to press. It appears below.—Eds. "B.J."]

Government Cameras for Sale.—Photographs taken by airmen played an important part in military operations. The Disposal Board of the Ministry of Munitions now announces that, from time to time, apparatus suitable for aerial photography will be available for sale. Attention is also drawn to a quantity of cameras, plates, tripods, and other accessories suitable for ground work, and cinema cameras, together with a small quantity of films. The stock is in London, and information can be obtained at Caxton House, Westminster.

Answers to Correspondents.

SPECIAL NOTICE.

In consequence of general reduced supplies of paper, as the result of prohibition of the importation of much wood pulp and grass, a smaller space will be available until further notice for replies to correspondents.

Moreover, we will answer by post if stamped and addressed envelope is enclosed for reply: 5-cent. International Coupon, from readers abroad.

The full questions and answers will be printed only in the case of inquiries of general interest.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

B. G.—Formula for ordinary film cement consists of acetone and amyl acetate mixed in equal parts, and then as much clean celluloid chips or shavings dissolved in it to make it sufficiently thick for convenience in use.

D. E. N.—In some cases the police authorities require a photographer canvassing for photographs to be taken to have a hawker's licence. You should apply for information at the nearest police office in the district where you propose to work.

R. L.—There is no book on the mechanism of focal-plane shutters; in fact, no literature on the subject apart from the papers on the theory of the shutter and the patent specifications of particular types of shutter. We imagine that the latter may be of some slight use to you.

C. E.—The business of outdoor photography and commercial photography now comes within the Retail Businesses Licensing Order, and you require to obtain a licence if you are newly starting such business. You should apply for the necessary form to the Secretary (New Business Licences), Iddesleigh Mansions, Westminster, London, S.W.1.

C. P.—For photographic reproductions of works of art apply to the Autotype Fine Art Company, 74, New Oxford Street, London, W.1, or to Messrs. W. A. Mansell and Co., 405, Oxford Street, London, W. We do not quite know what you mean by Continental studies, but you might try the International Art Company, Florence House, Nassau Road, Barnes.

C. L.—There is no method of retouching ferrotype for copying. The best thing you can do is to copy-enlarge upon a decent scale and then work up either the enlarged copy negative or a print from it, afterwards making a fresh negative from one or other of these. This is the method commonly adopted in working from these defective originals, and a very great deal can be done either at the negative or positive stage.

W. P.—1. Six lamps, each of 1,000 c.p., should be ample. 2. Ten feet from the floor is as high as you need have the lamps; eight feet would do at a pinch. 3. Certainly, a great advantage to be able to bring the lamps lower for seated figures, and particularly for children. 4. Yes, each should be on a separate switch for economy of current, and for better control of the light. We can usefully refer to the "B.J." of October 26, 1917, containing a "Practicus" article on fitting half-watt lamps. Our publishers can still supply at 4½d., post free.

N. E.—The "Osram" half-watts are the original lamps of this type, and possibly are the best, though we doubt if there is any ascertainable difference in quality between them and the "Mazda," made by the Thomson-Houston Company. We believe there are other makes of half-watt than the above; in fact, we bought two only a day or two ago for home use, and they seem all right, but it is impossible to say whether they are better or worse as regards actinic value. For your studio we think four or six 500-watt lamps would be ample.

M. N.—If the yellow stain is not very severe, you can probably easily remove it by making up a solution of bleaching powder mixed with about an equal weight of carbonate of soda (washing soda), say, 1 oz. of each in half a pint of water. Shake up this mixture and let the deposit settle, and use the clear or semi-clear liquid. If the stain is really heavy it will probably not yield to this method, in which case a very satisfactory process is that worked out a year or two ago by the Ilford Company, working instructions in which you will find in the 1917 Almanac, p. 353.

K. L.—1. The best way for anyone not versed in the reclaiming of silver from emulsions is to dissolve the emulsion in hypo and throw down the silver with liver of sulphur. Certainly, there is a great deal more silver in unused plates than in negatives. Comparatively little of the silver in a plate is retained in the developed negative. 2. The bluish stain is probably the kind of bloom which forms with age, due to gas and other atmospheric fumes. Depending on its age, it can sometimes be removed by rubbing with hard rubber, or by slight treatment with an abrasive preparation such as "Frictol," of the Vanguard Manufacturing Co., Maidenhead.

W. T.—Exposures are always pretty long with a gas lamp installation, averaging from 5 to 8 seconds with an $f/4$ lens and an ultra-rapid plate. Possibly your lens and plate are both slower, which may account for the longer exposures. The harsh lighting suggests that you have got the sitter too near to the light. If you treat the area of the illuminant as a window admitting daylight you get a fairly good guide as to how you are to place the sitter. The alternative, and more actinic light, is obtainable by magnesium flash. A very good model of lamp is sold by the Tress Company, 4, Rathbone Place, Oxford Street, London, W.1. The cost is, or was, about three or four pounds.

R. K. K.—If the subject is large in the 5 x 4 print, the latter is quite big enough for sending to the Press, but if a figure is only small on the 5 x 4 negative, it is well to enlarge part of the negative to 5 x 4 or to half-plate. Except for subjects which it is thought a journal may devote a very large space to, there is no object in making larger prints than half-plate. There is no objection to sending the same photographs to different papers; it is the usual custom to do so, or you could very likely make good use of a Press agency, which would show your work to all the London papers. Two such firms are Barrett's Photo Press Agency, 89, Fleet Street, London, E.C.4, and the Press Photographic Agency, 170, Fleet Street, London, E.C.4.

H. P.—You do not tell us the diameter of the condenser, which latter affects the question. But if your condenser, as we imagine, is about four inches diameter, then you ought to have no difficulty in getting a clear, shadowless illumination with an $f/6$ lens of $5\frac{1}{4}$ focus. The best place for a diffusing screen is as near to the light-source as you can put it, but usually it answers every purpose to put it on the side of the condenser nearest the light. We should imagine that your trouble comes from the extended area and particular form of the filament lamp. A better light-source would be a filament of the focus type, although it is not very suitable for the vertical type of enlarger. If we were you, we should use a gas illuminant in the shape of the "Howellite" inverted incandescent burner, supplied by Griffins', which is a first-rate light for enlarging, and particularly suitable for a vertical enlarger.

E. N. D.—Why not try the Vandyke method to obtain the ink line on glass, using the original sketch as a positive? Thoroughly clean the glass and then soak in a 10 per cent. solution of ammonia for two or three minutes, again rinse, and coat with the following solution:—

Water	10 ozs.
Process glue	$1\frac{1}{4}$ ozs.
10 per cent. ammonium bichromate sol.	$1\frac{1}{2}$ ozs.
Ammonia (.880)	3 drops.

Whirl dry. Use the original sketch to print through on to the sensitised glass. After exposure develop in water and then dye up, dry film, and roll up with a good black ink, and lay aside for two to three hours. Place in a 5 per cent. solution of hydrochloric acid to remove resist. You will experience a difficulty in obtaining a dense black image unless the glass is first coated with rubber or celluloid varnish.

J. T. B.—1. Yellowness of pyro-developed negatives developed in a tank can generally be overcome by adding additional quantity of sulphite to the working developer. There is no need for you to alter your formula for the stock solutions, which is a fairly good one, although we do not agree with the practice of putting the carbonate and sulphite in the same solution. We would sooner have the 8 ozs. of sulphite along with the pyro. However, apart from that, if you dilute the developer with 10 per cent. of sulphite solution in part substitution of the water, you should avoid yellowness in the negatives. 2. Negatives on isochromatic plates should have all the qualities of those on ordinary. If you send us a negative or two we could advise you better, but, generally speaking, if you use the makers' formulæ for the developer, you ought not to have the fog and appearance of over-exposure of which you complain. As a rule, an iso plate develops best with a rather weaker developer (more water) than one of the ordinary kind.

J. H.—1. The Mackenzie-Wishart slide consists of an envelope within another, the pair holding one plate. These envelopes require to be used with what is called an adapter, which is a shallow box with a hinged back and draw-out shutter, which takes the place of the dark-slide in the camera, and is used for manipulating the two halves of the plate envelope. 2. Absolutely nothing better than a big changing bag with a couple of sleeves. We have used other contrivances in the shape of boxes and bags with windows, but our experience is that the ordinary bag is the best, and it is very easy to change plates by touch. 3. The most convenient pattern of trimmer is the trimming desk of the Merrett pattern, sold by the Adhesive Dry Mounting Company. The print is laid in position on a hinged desk underneath a guide, and the protecting portion trimmed by pressing down the desk. For very accurate trimming you cannot do better than supplement the use of such a desk by an ordinary draughtsman's drawing-board, T-square and set-square, using these to mark the print with pencil lines which can then be most accurately cut through in the trimming desk.

The British Journal of Photography.

Line Advertisements.

Charges for Insertion.

Since advertisements cannot be inserted until fully and correctly prepaid, senders of line announcements are asked to bear in mind the scale of charges. They will thus save themselves delay in the publication of their announcements. A Schedule by which an advertisement can be correctly priced will be sent on request.

Net Prepaid Line Advertisements.

12 words or less	1/-
Extra words	1d. per word.

(No reduction for a series.)

Special Note. Box Number Advertisements.

"Box No." and office address	charged as 6 words.
For forwarding replies add ...	6d. per insertion for each adv't.

If replies are called for this latter charge is not made.

Advertisements cannot be inserted until fully and correctly prepaid.

Orders to repeat an advertisement must be accompanied by the advertisement as previously printed.

Advertisements are not accepted over the telephone or by telegram.

The latest time for receiving small line advertisements is 12 o'clock (noon) on Wednesdays for the current week's issue.

Displayed Adv'ts should reach the Publishers on Monday morning.

The insertion of an Advertisement in any definite issue cannot be guaranteed.

HENRY GREENWOOD & CO., Ltd., Publishers, 24, Wellington Street, Strand, LONDON, W.C. 2.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3096. Vol. LXVI. FRIDAY, SEPTEMBER 5, 1919. Price Twopence.

Contents.

	Page
Ex-Cathedra	513
Tracing Defects in Negatives	514
Practicus in the Studio. By Practicus	515
Night Photography. By Robert Dykes, F.R.P.S.	516
Mapping From Air Photographs. By M. N. MacLeod, D.S.O., Lieut.-Col., R.E.	518
Meetings of Societies	522
Commercial and Legal Intelligence	523
News and Notes	523
Correspondence—	
The Photographic Section of the R.A.F.	524
Analecta	524
Answers to Correspondents	524

SUMMARY.

In searching for the cause of defects, such as fog in negatives, examination of the working conditions is as necessary as scrutiny of the negative. The former is much more likely to locate the cause than is the latter. (P. 514.)

In his article this week "Practicus" deals with the leakage of water through the studio roof. He describes methods of glazing which should prevent the nuisance, and has something to say on remedies which can be applied in emergencies. (P. 515.)

In the further portion of his article on night photography Mr. Robert Dykes, F.R.P.S., deals chiefly with the after-treatment of negatives of night subjects and with the making of prints and lantern-slides. (P. 516.)

The recent paper of Lieut.-Colonel M. N. MacLeod before the Royal Geographical Society on mapping from air photographs continues the description of methods used by the French and the British and by the Germans. It concludes with a brief summary of the further progress which requires to be made. (P. 522.)

Particulars of surplus aerial photographic supplies which are being offered by the Disposals Board appear on page 523. The photographic goods at present listed include many aerial cameras, lenses of focal lengths from 5 to 30 ins., and a great variety of printing papers. (P. 523.)

In the making of white-margin prints an immense amount of time may be saved by having ready to hand an outfit of card negative carriers, the aperture in the card forming a mask of given size and shape. (P. 513.)

The system of displaying a reduced price and of making good by extra charges is one which in the end probably does not pay a photographer. (P. 513.)

"Colour Photography" Supplement.

In a review of colour photography, Lieut. H. E. Rendall states his opinions, largely from practical experience, of the various processes, more or less in use immediately before the war, for the making of three-colour prints. In conclusion he outlines a suggested process of two-colour printing. (P. 33.)

The Colour Laboratory of the Bureau of Chemistry attached to the United States Board of Agriculture has published working details for the laboratory preparation of the colour sensitising dyes known as pinaverdol and pinacyanol which are designated at Pv. I. and Pc. IX. (P. 34.)

Mr. S. G. Yerbury writes putting in a plea for further investigation of methods of direct photochromy as likely to be more fruitful than the three-colour processes currently in use. (P. 36.)

EX CATHEDRA.

Extra Charges. Some photographers make a practice of quoting an apparently low price for their work, and then endeavour to make it remunerative by making a considerable extra charge for modifications which the customer did not expect to pay for when entering the premises. For example, we find a man filling a window with postcards, say, at 3s. 6d. per dozen, and charging another eighteenpence for sepia toning, while an additional charge is made for a second figure or a slightly larger head. This is objectionable both from the point of view of the sitter and the photographer, and in the end does not tend to improve business. If different classes of work are done, it is much better to show plainly priced specimens of each, so that sitters can choose at the outset and not have a feeling that they have been rushed. Even better-class studios are not above this sort of thing, quite a disproportionate increase being made upon prices shown in the window for any modification in style. We have it upon the authority of one who has tried both ways that the abolition of extras, as extras, has resulted in a marked improvement in his takings. If the photographer looks at his own practices as he looks at those of the bootmaker who charges him sixpence extra for a pair of laces for boots already twice pre-war price, he will realise the feelings of his sitters.

* * *

White Margins. It is often necessary to produce prints having a white margin which may be as narrow as one-eighth of an inch or several inches in width as the class of work may demand. Unless there is some system of preparation a good deal of time is lost in improvising and fixing masks, and unless these are properly secured there is always a risk of spoiling good paper. A plan which we have found to work well is to keep a special printing frame for the purpose with a good sheet of clear glass in it. This frame must, of course, be as large as the largest paper to be used; if the subject is not well centred upon the plate it must be larger. The next step is to provide several cards not thicker than the negative-glass, and to cut out openings into which the plate will exactly fit. Round the margins of these openings are fastened strips of passe-partout binding overlapping the edges so as to give the desired width of margin. All that has now to be done is to drop the negative into the frame, and when the print is not larger than the plate to lay the paper so as to correspond with the edges of the plate. For larger sizes register marks made of the same binding strips should be stuck on the card, so that the margins may all be uniform in width and square with the subject. If the subject has to be in an oval or circle, this must be cut out of black or red paper and pasted in the card frame instead of the strips. If a dozen or so of

these frames are made for each sized negative with different openings any negative may be fitted in a few moments.

* * *

Lens Caps. Nowadays, exposures made with the lens cap are by no means as common as they were years ago, and frequently we find expensive lenses devoid of these fittings. But, quite apart from their use as a means of exposing plates, a well-made cap should be regarded as inseparable from a good lens when the instrument is not in use, even if attached to the camera; while if it is usually taken off and stored separately, a cap should be fitted over each end as a protective measure. In this respect the modern shallow hood of the anastigmat lens seems to demand the protection afforded by the cap far more than did its predecessors of thirty years ago, when the hood of the instrument allowed the glasses to be set far back. Speaking of lens caps reminds us that many of the present-day photographers cannot make an exposure with the cap without running a serious risk of blurring the negative through shaking the camera. Some time ago we saw a photographer, whose roller-blind shutter had failed him, take off his lens cap to make an exposure with a sudden wrenching motion. The correct way is to remove the cap with a gentle circular screwing-off action, lifting it in an upward direction, and thus to some extent equalising the exposure of sky and foreground if the subject is a landscape.

TRACING DEFECTS IN NEGATIVES.

The perfect result in photography is dependent so essentially on the absence of the many conditions which can introduce defects that it is difficult for anyone but the individual worker to say with any certainty what is the cause of spots or fog or any of the miscellaneous ills which beset gelatine negatives. Yet, despite this fact, it is part of our daily work to do what we can to locate the cause of one defect or another in negatives which are sent to us by our readers. Without wishing to discourage any of these latter from their habit of seeking such help as we can give them, it must be admitted that in many cases all that we can do is to make a guess at the cause and to leave the correctness of our guess to the further judgment of the inquirer. In some instances, perhaps, our suggestion may indicate a cause which had not been thought of; in others, no doubt, such cause had been definitely eliminated by the inquirer's knowledge of his working conditions. At any rate, it seems useful to offer a few notes on the general plan which may be followed in endeavouring to come to a decision as to the cause which makes a negative defective in one way or another.

Probably the defect which is most frequently brought to our notice is a general fog or veil over the negative. In this connection it seems not to be realised by many querists that very different causes may lead to an almost identical effect, and that the solution of the problem lies more in an examination of the working conditions than of the negative. From the latter it is impossible to say whether the fog is light fog or chemical fog, that is to say, if it is produced by extraneous action of light in conjunction with a properly compounded developing bath or has its origin in the faulty development of a plate which has been exposed only to light reaching it in the correct manner through the lens. Certainly the negative does give some slight guide in these circumstances—namely, by the appearance of the narrow margin of the plate which usually is shielded from light during exposure in the camera by the rebate of the dark-slide. If this narrow edge is reasonably clear and free from fog in the negative, it follows that the cause of the fog must lie in the kind of image which is formed on the plate, and cannot very well be the result of a faulty developer or an unsafe dark-room light, either of which would affect the plate up to its extreme edges. Thus the condition of these rebate edges in the negative is a first hint of the direction in which to look further for the cause of the defect. If the edges are clear, the fogging of the plate is most probably due to a dirty condition of the lens or to the illumination of the inside of the camera to an extent which can cause a general veiling of the plate during the period of exposure. The two things often go hand in hand, but even when the lens is free from a coating of dust which causes it to distribute light on to the plate somewhat like a window of frosted glass, the conditions may be such that the fog comes from light reflected from the interior of the camera on to the plate. The wide-angle over which the modern anastigmat covers is responsible for fog from this cause: the interior folds of the bellows come within the cone of illumination from the lens and cause veil by reflection on to the plate. It is here that a lens-hood or a diaphragm placed within the camera proves to be of decided benefit. The reputation of the older types of R.R. and single lenses for bright images probably arises as much from their deficiency in angle of illumination as from their optical qualities *per se*. Moreover, the use of the wider angle anastigmat has extended along with a reduction in the dimensions of cameras and with the growth in popularity of the taper bellows, which explains why a given lens will yield brilliant negatives free from any suspicion of veil on an old-fashioned camera of the square-bellows type, whilst an exactly similar lens in a taper bellows camera will give trouble from veil.

When we come to the causes of general fog over the whole area of the negative one of the things which will, of course, occur at once is want of safety in the dark-room illumination. This may arise either from leakage of white light into the dark-room or from passage of actinic rays through the safelight of the dark-room lamp. A little hint as regards the former is worth mentioning, since we know that it has proved the means of tracing leakage of light which remained undetected until it was used. It is simply to lay a piece of mirror in the empty developing dish, and with all lights extinguished to examine the mirror for any reflection of light. It may happen from the special way in which a dark-room has been fitted up, often by partitioning off part of a larger room, that outside light finds it way to the developing dish from a source which cannot be seen unless one can take a look round exactly from the position which the plate occupies. The mirror enables one to do this. As regards the dark-room light itself, the production of fog from this source is readily detected by the usual plan of laying a plate in the developing dish in total darkness, at the same time laying one or two coins on it. If then the dark-room light be turned on and the developer applied for, say, ten minutes, the presence of any insecurity from this cause should be revealed by the production of the outlines of the coins on the plate. In making such a test as this it is too often forgotten that the safety of a dark-room light increases considerably with the distance from it; it will not do to make the test with the developing dish 3 ft. away and then expect an equal safety of illumination if plates are handled or developed close to the lamp.

If tests for the unsafeness of the dark-room light yield only negative results, the trail for fog must be followed in the composition of the developer or in its contamination during use. We have known of cases where fog which for a time baffled detection was traced in the end to using the anhydrous instead of the crystallised form of sodium carbonate. By practically doubling the proportion of car-

bonate in the developer it is obvious that, with many formulæ, fog is bound to be produced. But perhaps the most common cause is contamination of the developer with hypo, brought about very often through belief that the dark-room towel, which is regularly in use for wiping fingers which have dabbled in the fixing-bath, actually cleans them thoroughly from hypo solution. As we emphasised in a note not long ago the dark-room towel too often serves as a distributor of hypo, and a rule should be made of keeping it to its proper purpose, which is for drying the hands after they have been rinsed from any chemicals under the tap.

PRACTICUS IN THE STUDIO.

[Previous articles of this series, in which the aim of the writer is to communicate items of a long experience in studio portraiture, have appeared weekly since the beginning of the present year. It is not thought possible to continue the series to the length of that by the same writer which ran through the "British Journal" some years ago, but if any reader among the younger generation of photographers, and particularly those engaged as assistants, has a particular subject which might be dealt with, his or her suggestion will be welcomed. The subjects of the previous articles of the series have been as follows :—

A Talk About Lighting (Jan. 3).
The Camera and the Lens (Jan. 10).
Managing the Sitter (Jan. 17).
Backgrounds (Jan. 24).
Studio Exposures (Jan. 31).
Artificial Lighting (Feb. 7).
Printing Processes for Portraiture (Feb. 14).
Studio Accessories and Furniture (Feb. 21).
The Surroundings of the Studio (Feb. 28).
Studio Heating and Ventilation (March 7).
The Postcard Studio (March 14).
The Printing-Room (March 21).
About the Reception Room (March 28).
Home Portraiture (April 4).
Portable Studios (April 11).
Copying (April 18).
Handling the Studio Camera (April 25).
More About Lenses (May 2).
Enlargements (May 9).
Advertising the Studio (May 16).
Mounts and Mounting (May 23).
Business Methods (May 30).
Photographing Children (June 6).
Portraits of Elderly People (June 13).
Something about Lenses (June 20).
Hand Cameras for Professionals (June 27).
The Dark-Room and Its Fittings (July 4).
Plates and Their Work (July 11).
Apparatus Repairs and Renovations (July 18).
Posing the Head (July 25).
Intensifying Portrait Negatives (Aug. 1).
Workshop Jobs (August 8).
The Personal Factor (Aug. 15).
The Keeping of Negatives (Aug. 22).
Reduction of Negatives and Prints (Aug. 29.)

LEAKY ROOFS.

There are few who have worked in the ordinary type of studio who have not, at one time or another, experienced the misery of working under a roof which was not water-tight. I have known well-built places, where no expense was spared in erection, which possessed roofs which it seemed impossible to keep sound by any ordinary methods. Time after time the glaziers were called in, but their labour only resulted in a temporary alleviation of the trouble, a few months, or even weeks, producing another crop of leaks.

There are two principal causes of the trouble in question, one being the failure of the putty, or other fixing material, and the other siphoning of water between the overlapping edges of the glass. The former is the most usual and the most troublesome, as the latter may be entirely avoided by having a narrow overlap, only, say, a quarter of an inch. This also avoids the disfiguring bands of dirt which collect between overlaps of half an inch or more. Moreover, the margins of the glass should not be in actual contact. The former is due to the putty having lost its tenacity and allowing water to penetrate between the sash bars and the edge of the glass. To avoid this, it is a good plan to dispense with putty altogether when building a new studio, or entirely replacing the roof, as there are several good systems of what are called "metallic" glazing which I shall refer to later. When designing a studio it should be borne in mind that the steeper the pitch of the roof the less is the likelihood of leaking; so that we can secure entire immunity by adopting Robinson's suggestion of a high side light only, as then there is no roof to leak. Next to this comes the single slant with its angle of 62 degrees. With this slant the water drains away so quickly that little, if any, will pass through even if the glazing be faulty.

The great majority of studio roofs have wooden sash-bars, and these seem to be more affected by climatic changes than iron ones. One would naturally suppose that iron would expand and contract to a greater extent with given change of temperature than wood, and possibly it does, but iron is waterproof and does not absorb water, so that this may account for the apparent anomaly, for we have all noticed that it is after a long spell of dry, rather than hot, weather that the leaks put in an appearance. A roof with metal sashbars, and what is called lead glazing, is more costly than a wooden one in the first instance, but in the long run will be found cheaper, as, except in case of breakage, no labour will have to be expended upon it, and all damage to blinds, furniture, and apparatus will be avoided. There are various systems of which particulars may be found in the building trade papers, but in principle they are the same: a metal bar, somewhat similar to the wooden ones, but with a small channel down each side, coming under the edges of the glass. When the glass has been placed in position a broad strip of soft lead is screwed on to the middle rib and pressed down so as to cover the edges of the glass to about the same extent as the putty usually does. This construction has the additional advantage of permitting a broken pane to be quickly replaced, no matter what the state of the weather may be.

With wooden bars the trouble is caused by the putty perishing and coming away from the wood, so that water can penetrate between the edge of the glass and that of the wood, and the problem is how to prevent this when building the studio and how to cure it if it happens. When sashes are made in the ordinary way they receive before glazing a coat of paint, usually pink in colour, which is called "priming." This paint is usually very poor stuff, some of it being innocent of white lead. For our purpose, before glazing, the rebates which are to hold the putty should be carefully coated with the best quality of paint—i.e., pure white lead, linseed oil, and turpentine. These materials are unfortunately very expensive just now, and there are many substitutes in use, so that care should be taken to get the real thing. When this coat of paint is dry, but not hard, the glass should be bedded into a thin layer of putty, then a thin coat of paint run along the edge where the putty will come, and finally the putty put on and smoothed in the usual way. No more putty than is needed should be used, as a thick fillet

of putty is more likely to shrink away from the glass than a thin one.

Now, a word as to putty. This should be made of whiting and pure linseed oil, and there should be plenty of oil. Some of the war-time putty is very poor stuff, so that it is better to pay a little more to have it right. As a matter of fact, it is easy to make one's own putty and to work into it any remnants of paint which by virtue of the white lead will add to its durability. As it has been shown that the weakness of putty lies in its liability to harden and crack away from its surroundings, it is to be presumed that a putty which would never become really hard would be a desideratum. Mr. F. A. Bridge claimed that a mixture of two parts of putty and one part of Stockholm tar possessed such a quality, and that he had prevented leaks in his studio for many years by its use. I have never used this mixture myself, but I knew Mr. Bridge's studio well, and it always appeared watertight. A very durable glazing may be made by omitting the top fillet of putty and putting instead upon the painted margins of the glass and wood a strip of strong tape soaked in paint, working this into contact with the surfaces by means of a medium-sized sash tool. When this is dry it should receive another coat of paint, which can be renewed from time to time as it becomes affected by the weather.

When leaks occur in an old roof it is next to useless to try to cure them by filling in the gaps left by the old putty. This may act as a temporary stop, but as soon as there is a spell of fine weather the entire row of glass should be removed and replaced according to one of the methods just described. I may just hint that it is advisable to keep two or three sheets of glass of suitable size in stock so that no time need be lost in the case of a smash occurring in wet weather. If a pane happens to get cracked so badly as to allow water to enter it may be temporarily repaired by painting a band over the crack and applying a strip of tape or calico, as recommended for glazing. This is rather unsightly, but is efficacious.

There is a way of dealing with a leaky roof which has the advantage that it can be done from within, and that no skilled labour is required. It consists in the application of a light zinc channel underneath the sash-bar, so that any water which finds its way through is caught and led away to where it can be conveniently collected. For each sash-bar to be treated we shall need a strip of zinc the length of the bar and about an inch wider than the inside surface of the wood. This is turned up on both edges so as to make a channel about a quarter of an inch wide and the same depth, being attached to the centre of the wood by screws about a foot apart. If possible this should be carried out into the open air, but if this is not possible a dish or jar must be placed to receive the drainings. This is perhaps rather a clumsy device, but has proved useful in many cases, especially in bad weather when nothing else can be done. It is, at all events, better than having to stand dishes about the studio, where they may be much in the way when working. Sash-bars with such side grooves are an article of commerce both in wood and metal, and if these are fitted when building the roof the drip will, of course, be conducted outside the studio.

In view of having to effect repairs, it is a good plan to provide one or more light planks, which can be rested upon the sash-bars so that any part of the roof can be reached in safety. If the bars are of wood, strong screws projecting a couple of inches should be fixed in them so that the plank can rest upon them. Naturally these must be placed a little farther apart than the width of the plank. In the case of iron sash-bars the plank must be supported by ropes—strong sash line will do—thrown over the ridge and secured on the other side of the roof.

There is one little moral to be drawn from all this, and that is to have no more glass in the roof than is actually necessary. I have worked in a studio which was entirely covered with glass, the greater part of which was obscured with brown paint. This answered its purpose, but did not prevent leaks, which occurred to three times the extent which they would have done in a more rationally constructed place. PRACTICUS.

NIGHT PHOTOGRAPHY.

[Perhaps no branch of outdoor photography offers so great a degree of attractiveness as that of outdoor scenes under artificial illumination, particularly to those in large cities where an abundance of subjects of this kind is available. Since the immediately forthcoming season is the best time of year for night photography we take the opportunity of publishing a comprehensive practical article on the subject by an expert in it of long experience, Mr. Robert Dykes, F.R.P.S., formerly senior scientific assistant to the late Sir John Murray, K.C.B., F.R.S., and of the North Sea Fishery Investigations. Part of these notes appeared in a manual on night photography by Mr. Dykes, issued some years ago by Messrs. Dawbarn and Ward, but long out of print. In this final instalment Mr. Dykes describes a method of introducing night and interior subjects into cinematograph films.—Ed. "B.J."]

(*Continued from page 503.*)

When to stop development is a most serious question, a question often asked, but not easily answered, at least in daylight work. However, one may safely say that a plate is fully developed when the clear margin around the edge due to the rebate of the carrier begins to get discoloured or smoky. The blackness of the high-lights should also be taken into consideration; they must be pretty strong, yet not too strong, or they will print out chalky. Having given half an hour or more for the development of a plate that has been pretty correctly exposed, give it a rinse in a little stronger developer for a moment, wash in water for a minute, and place in the fixing bath. This should be pretty strong, a little stronger perhaps than that used for daylight negatives, as there is considerably more silver to remove. I have no special strength, speaking in a Pickwickian sense, and pop them into a bath made up in a very rough and ready and not too economical way. Thorough fixation is essential, and the plate should not be examined by ordinary light until fixing is complete. I never allow less than fifteen to twenty minutes for this operation; and if the plates are double-coated, not less than thirty to forty minutes.

When a photographic plate is removed from the developer the emulsion is saturated with oxidised and unoxidised developer, caught up or occluded in the emulsion with the reduced silver. Now, if we can imagine a greatly magnified section of the negative in which we can see the actual atoms of silver we would also see this occluded developer as a filament around each silver atom, this envelope of developer holding on by capillarity, much as a film of moisture holds on to one's finger if dipped into water. The brief rinse that one gives to a plate on removal from the developer to the hypo is insufficient to knock this occluded developer out of the emulsion, and negatives of night scenes are so full of unreduced silver that until the hypo has well penetrated the emulsion it is not advisable to turn up the white light. I can hear some photographers pooh-poohing this statement as being rather far-fetched. For ordinary negatives the little harm that might be done would be negligible, but I have obtained a veil before now over an otherwise perfect negative in which the shadows were full of detail, but almost clear glass.

Having fixed our negative, washing is the next and not least

important proceeding; this should be done in perfectly clean running water, so that on removal from the washing tank there are no specks of grit or other particles adhering to the emulsion.

Precautions must be taken in the drying to ensure a perfectly clean negative. Finger marks, dust, scratches, etc., all show up only too plainly when the plate is dry if care has not been taken. There is so much clear gelatine present that dust and marks of any description are far more serious on a "nightscape" than they would be on a daylight production, particularly if they are required for lantern plate purposes. Stains due to the water trickling down the plate when set up to dry may be prevented by mopping up all the superfluous moisture with a very soft piece of rag, free from fluff, such as an old handkerchief.

Intensification is of no use for this class of work, except perhaps locally to emphasise traces of clouds in a sky. I would strongly advise that a negative be thrown out, and the view re-taken if possible rather than attempt to doctor it up. No amount of intensification will put into a negative what is not there already, and as this treatment affects the whole plate the result is flatness and want of contrast, and without relief and contrast, upon which night views so much depend, our negative is absolutely worthless.

Reduction may be attempted with a certain amount of success, but care has to be taken that it is not carried too far. A reducer should be used that attacks the high-lights first, such as ammonia persulphate. If a ferricyanide reducer such as Farmer's is used the detail in the shadows will be rapidly eaten out. Local reduction is necessary sometimes when an arc lamp shows up too strongly in a view. The mechanical "Globe" metal polish reducer is very handy in such cases if used with a soft artists' stump or a small piece of chamois leather. A great deal may be done with pencil, stump and brush to brighten up the high-lights or soften the shadows.

As to the preservation of the negative, it should be carefully varnished, the plate being well flooded with clear filtered varnish and then *thoroughly drained* before setting up to dry, for little rills of varnish will print up distinctly. Thin negatives of this description ought to be varnished if they are valued at all, although I may say I do not varnish my own, and as a consequence have lost a goodly number of them through printing stains, etc.

There are many different styles of printing, but the best effects are undoubtedly obtained by printing in pure black and white, for browns, reds, and various other tones hardly lend themselves to "shades of darkness."

First and foremost stands the platinum print, with its beautiful cold black or warmer sepia tones. It is an ideal printing process; at least, thin negatives such as "nightscapes" are ideal printers for this method. Then comes carbon, either by the single transfer process, suitable for some views, such as country scenes, where reversal of the image is of no moment; or by the double transfer process, where it is necessary to have our print the right way about. I prefer black carbon for all classes of night work, but have used blue and even green for moonlight and snow scenes. I would like to warn carbon printers who do not use a safe edge in printing their daylight negatives to do so always in night views, as, owing to their thinness and the rapidity of carbon tissue, they are very quick printers. The gelatine pigment in the shadows as a result frequently becomes so insoluble and tough that it works off the support in development. Many a fine print have I seen get up and walk in this way. Again, I would not recommend boiling over-exposed prints; endeavour to hit the right exposure, and develop up carefully in warm water. Contrasts are so great in night views that printing them in carbon requires considerable skill. The tissue or gelatine pigments perhaps on development won't budge in the shadows except it be in the lump, and the high-lights, on the contrary, may run so fast owing to under-exposure that they are soon out of sight. Yet the correct exposure once hit—and there is a good amount of latitude, generally speaking, two or three minutes—and you cannot wish for a better or more artistic process.

Coming now to the more workable, less troublesome, and therefore easier methods of printing night views, we have a paper that cannot be equalled for giving platinum-like results—viz., the slow contact paper that permits of getting out all the fine qualities of the negative, and gives rich blacks, soft greys, and pure whites. I prefer it to ordinary bromide paper for night work, as it gives more contrast.

Finally, we have bromide paper of many different makes and of very fine quality either for contact or enlarging purposes. I rarely use it myself for contact work, but use a great deal of it for enlarging. For sharp close grain and pure black and white effects there is nothing like "Wellington" smooth platino-matt; but for artistic effects of breadth and tone Eastman tinted "Royal" is superb.

As to the development of any of these gaslight papers I use amidol, and although I have tried other developers, have not yet come across one to equal it in giving rich velvety black tones. I make it up according to the following formula:—

1 ounce sodium sulphite,
6 grains potassium bromide,
40 grains amidol,
20 ounces water.

As amidol in solution does not keep more than a day or so, it is better to make the developer just before use. The developer must not be diluted, and if, owing to size of paper used, or to using heavy rough papers, it is necessary to soak them in water before development, only use nineteen ounces of water in the above formula. If dilution is resorted to, the blacks obtained will not be black at all, but grey; this may sound a somewhat Irish way of putting it. For this reason also do not leave prints lying too long in the fixing bath; at the same time ensure thorough fixation. Unlike the negative, there is less silver to remove owing to the shadows predominating and the greater amount of reduced silver in the print.

Toning bromides is of no use for night studies, but a yellow colour may be imparted to the high-lights by immersing the worked print in a solution of potassium permanganate about 2 per cent. in strength. This gives an antique and charming effect to the paper, providing it is carefully and properly done, for if too much permanganate be used the print will, after a few days, turn purple and go off colour. Years ago I had the misfortune to exhibit a print treated in this manner, and it had not been on exhibition three days before it went purple in the face—presumably with shame. Needless to say it did not get an award; in fact, many must have wondered what on earth it was.

Choice of mounts and style of frame must be left to everyone's own particular taste, but I have found by experience that dead black borders and black frames set night pictures off to the best advantage.

There are many printing methods that are suitable for night photography, such as "gum-bichromate," the Ozobrome, and the Bromoil pigment processes. Using lamp-black pigments on simple broad nightscapes, one can get some most charming results, in fact, real impressionistic effects, giving that scope for artistic expression that pure photography kills with detail. Whistler's fine appreciation of atmosphere and luminosities enabled him to portray some of the most beautiful after-dark pictures, in which the unnecessary in the way of detail is entirely suppressed. These Whistlerian nocturnes are quite possible to attempt in photography by means of the pigment process of printing to those who have any artistic feeling.

In the preparation of lantern slides of night scenes the slowest plates obtainable should be used, and the reduction carried to the extreme to keep the high-lights from being too obtrusive when thrown on the screen. Some very fine effects may be obtained by toning, the number of different tones available in lantern slide work being considerable, and ranging from warm to cold blacks, blue-blacks, blues, and greens. The carbon process yields particularly fine slides for cautious workers, but demands a certain amount of skill and delicacy of handling.

In lantern slide making care must be taken to have perfectly clean negatives, owing to their preponderance of shadow or almost clear glass.

ROBERT DYKES, F.R.P.S.

(To be continued.)

MAPPING FROM AIR PHOTOGRAPHS.

[From the purely photographic standpoint the war-created art or craft of aerial photography can too easily be regarded as having been brought to a high pitch of perfection. It is quite true that by the combined efforts of opticians, camera constructors, and emulsion makers the obstacles which sheer height, the movement of the aeroplane or atmospheric conditions put in the way of obtaining well-defined negatives from the air have been almost completely overcome. Yet that, after all, is only half the battle. An aerial photograph is nothing except in so far as it fulfils a useful purpose. In the important work of map-making the following paper by Lieutenant-Colonel M. N. MacLeod before the Royal Geographical Society is a timely reminder, by an authority, of the distance the aero-photographic method has still to traverse before it can dispense with the surveyor to supplement or check its results. To anticipate Colonel MacLeod, a general conclusion to which he comes is that "for accurate work we cannot of course dispense with the surveyor altogether, and in hilly country, until we can devise some satisfactory form of stereo-plotter, the air photograph will not help us very much." Other geographers who discussed the paper shared this view, that aero-photo survey is a branch demanding further research, and that, more at the hands of surveyors and topographers than at those experienced in the purely photographic problems. Such an expression of opinion is not without its significance in reference to the ideas of photographic survey apparently held by the Royal Air Force, to which we recently devoted some attention.—EDS. "B.J."]

(Continued from page 505.)

Before the drawing is reproduced it is always advisable to have a final check made on the ground, to ensure that the interpretation of the photographs has been correctly done. Our method was to take a print from the fair drawing by "Ferrogallic" or "Ordoverax" process, cut this up into pieces of convenient size, and mount on card. The surveyor then took this to the ground and noted on it any errors in "interpretation" or omissions. These latter were not surveyed, but simply marked in roughly in their correct place, being plotted subsequently from the photograph print. Experience showed that this final check, which did not take long, was a very necessary part of the whole process, even when the plotting had been done by very experienced men. When, owing to the maps being of parts of enemy country, this check was impossible, its place could be taken to some extent by comparing the map with "oblique" photographs also taken from aeroplanes. These "obliques" were taken from a low altitude, and give a sort of panoramic view, on which vertical objects such as trees, buildings, and churches, etc., show up very much more clearly than on the ordinary vertical photographs. Unfortunately, they were rather difficult and dangerous to take, and we could not count on obtaining them, at any rate from the most favourable positions

The time taken in adjusting the enlarging camera and apparatus varied with the amount of distortion of the photograph, but averaged about five minutes. If the photograph is very much distorted it is difficult to get the image in focus all over the board, and this method of plotting is therefore not very suitable for very tilted photographs.[2] We rarely used tilted photographs for plotting work, but it would appear that the Germans, owing to their inferiority in the air, were compelled to place considerable reliance on them, and they appear to have used a different method of plotting, which I will describe later on. Before doing this I will say a little more about our own methods.

Having completed the map as described above, we had to keep it up to date by plotting on it all new trenches, battery positions, and the like which appeared on subsequent photographs. It was rarely necessary to use the enlarging lantern for this purpose, as, having once completed the map, one could always obtain a large number of suitable fixed points on any photograph and plot with sufficient accuracy and speed with the proportional compass. Occasionally, however, it is desirable to plot a point with greater precision; such points may be points required to enable another photograph to be plotted or points required by the artillery for use as a "datum" or "zero" point for registering or observing their fire. For such points the method known as the "four-point method" is often most suitable. It is as follows (see Figs 1*a* and 1*b*):

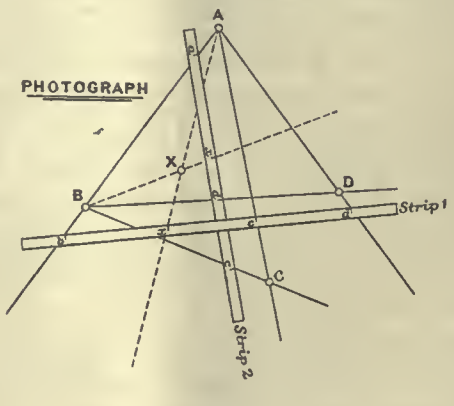


Fig. 1a.

Assuming four fixed points can be identified on the photograph, then using one point as apex, join it to the other three both on

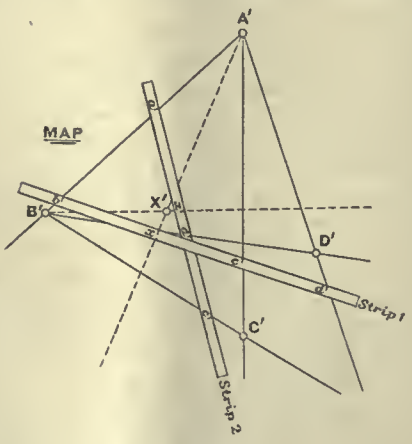


Fig. 1b.

the photograph and on the map. On the photograph draw a line from this apex to the point to be plotted, then, taking a slip of

[2] See previous footnote.

paper with a straight edge, lay it across these four lines, roughly at right angles to the centre one, and "tick" off on the edge of the slip the points where each of the lines cut it. Transfer the slip then to the map and lay it across the corresponding lines on the map, moving it about until the three "ticks" due to the "fixed" rays on the photograph come over the three rays ruled on the map. Now mark the map at the tick corresponding to the ray to the point to be plotted. A line joining this mark to the apex passes through the true position of the point on the map. Repeat the process, using another apex to obtain a second ray, whose intersection with the first gives the position of the point. Using a third apex, one gets a third confirming ray, which should also pass through the point and gives a check on the accuracy of the plotting.

These methods are theoretically accurate, whatever the inclination of the photograph, provided the points lie in the same plane, and in practice, when this is the case, the three rays obtained in this way give a perfect trisection. The proof depends on the fact that the anharmonic ratios of four points on a straight line are not altered by a perspective.

When instead of one point only a number of points have to be plotted by this method, it is best to stick the photograph down on a piece of paper and rule in the rays from the apex, produce them beyond the edge of the photograph and rule in the transverse line. Cut or fold the paper along this line, and, having ruled in the corresponding rays from the apex on the map, place the photograph over it, face upwards, and turn it about till the transverse line comes in its correct position, when it is ruled in on till the transverse line comes in its correct position, when it is ruled in on the map also.

The transverse lines are then scaled, and plotting can proceed without ruling further rays on the photograph by simply laying a straight-edge from the apex to the point to be plotted, and noting the scale, reading where it cuts the transverse line. The corresponding ray is plotted from this scale reading on the map.

I will now go on to describe some of the methods which appear to have been used by the Germans. The most useful of these is

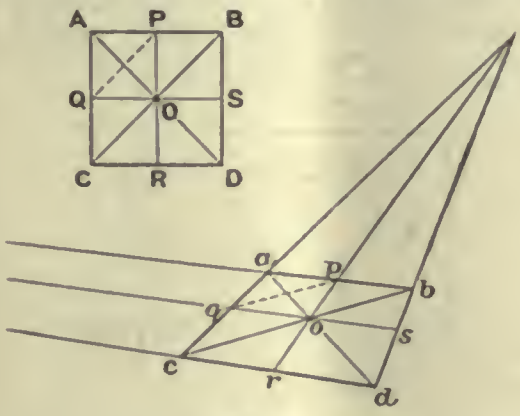


Fig. 2.

based on the principles of perspective in freehand drawing, and may be described as "perspective plotting" (see Fig. 2).

Suppose ABCD to be a square on the ground. In a photograph taken truly vertical this will appear as a square, but on a tilted photograph it will be seen in perspective and appear as a quadrilateral, *abcd*, of which the sides *ba* and *dc* converge to a "vanishing" point on the left, and *ca* and *db* to another "vanishing" point on the right.

The plotted position of O will be given by joining the diagonals of this figure and the positions of P, Q, R, S, by drawing lines from the two "vanishing" points through O. By joining PQ, PS, QR, SR, we can still further subdivide the true square and its perspective view and obtain further corresponding points on map and photograph, and this process can be continued indefinitely. The principle of perspective here involved is applicable of course to any figure; the square is selected for an example, as it is the easiest in which to follow the connection between the original and the perspective view.

To plot from a photograph by this method it is necessary to select a quadrilateral figure formed by four fixed points on the map and the corresponding figure on the photograph (Fig. 3).

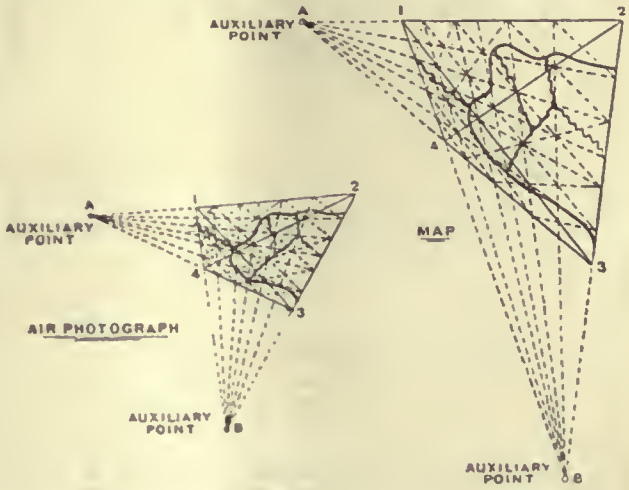


Fig. 3.

Join up the sides and diagonals and produce the converging sides to meet, both on the map and on the photograph. Then from each of the "converging" points draw a line through the intersection of the diagonals to cut the two opposite sides of the quadrilateral. This sub-divides each quadrilateral into four corresponding smaller quadrilaterals of which the diagonals are again ruled in, and the process carried on till finally both map and photograph are covered with a grid of lines joining points which correctly correspond to each other. When this grid is sufficiently small it is easy to sketch in by eye all the intervening detail on the photograph by its relation to the grid-lines. This method is useful for dealing with considerably tilted and distorted photographs, but is naturally not so satisfactory as our method of rectifying the print in a camera when the latter is possible. We never had occasion to use it, as, for mapping work at least, we were almost always able to obtain photographs which were very nearly vertical.

Tilted photographs are always objectionable for plotting by this or any other method, for the reason that differences of level on the ground introduce large errors; they can only be used with safety in flat country.

If five fixed points are available, plotting may be done in a similar way without the use of the auxiliary points obtained by producing the sides of the figure, by simply joining up each point to the three points opposite to it, and then from each point drawing a line through the intersection of the diagonals drawn beween the other four points and obtaining two corresponding grids in this way.

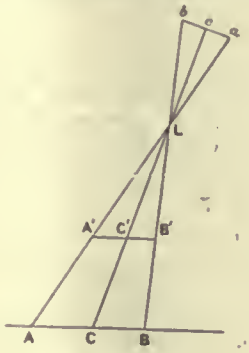


Fig. 4a.

It will have been observed in all the foregoing methods of plotting that at least four fixed points are required.

At first sight it might be seen that three points should be sufficient, and it may therefore be as well to consider at this stage the geometry of the plotting to see why four and not three points are necessary.

In Fig. 4*a*, suppose AB be two fixed points on the ground and

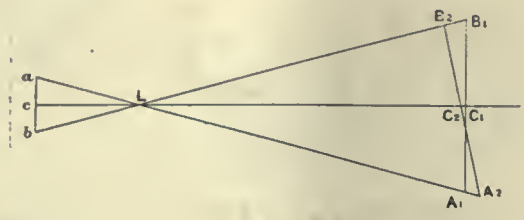


Fig. 4b.

C a point intermediate between them, *a*, *b*, *c* being the corresponding points as they appear on the photographic plate. Now, if on the plate *c* is exactly half-way between *a* and *b*, the line CL will bisect the angles *a*L*b* and ALB. The point C on the ground will not, however, be exactly half way between A and B unless the photograph is truly vertical, that is unless AL=BL.

Suppose, then, we have our air photograph *acb* and wish to plot the point C in its true position between *a* and *b*; we wish to plot it in the position C′ where A′B′, the correct *map* length of AB, is parallel to AB.

What we actually do with the photograph by means of the camera lucida or the enlarging lantern is shown in Fig. 4*b*.

We throw an image on to a board $A_1C_1B_1$ whose dimensions we can regulate by moving the board and the focus until $A_1B_1 = A'B'$. We can, however, also alter the length of any line in the image by tilting the board. When we do not know the angle at which the photograph was taken, how are we to know which means to adopt?

Obviously we do not know which to adopt unless we have other data. If we know the ratio AC to CB we evidently can get the adjustment along the line AB correct by moving and tilting the board till A_1B_1 is its correct length and A_1C_1 and B_1C_1 are also correct, that is into the position $A_2C_2B_2$, which is the only position which will have all the elements correct. To adjust in any direction in this way we therefore require three points. To adjust the whole photograph, which is in two dimensions, we must, however, adjust in two directions at right angles to each other, and we therefore require three points in each of two directions. One of these points can be a common point used for each direction, making five fixed points. If, however, we start with a quadrilateral of four points, the intersection of its diagonals gives us a fifth on both map and photograph, and we see therefore that four independently fixed points is the minimum number which give sufficient data in themselves for accurate plotting.

It may happen, however, that four independently fixed points cannot be obtained. Should this be the case, it is necessary to supplement the intrinsic data on the photograph from other sources. If the focal length of the lens used is known, a photograph can be accurately plotted from three points only, by a method evolved by the Germans and known by them as Hugerstoff's Pyramid Method.

This method requires a complicated geometric construction for plotting of each point, and I am thankful to say I have never had occasion to use it. It is as follows:—

If we draw in the rays from three points on the ground through the lens of the camera to their images on the photographic plate, we obtain two pyramids of equal apex (as in Fig. 5).

If we can determine this apex, we can reconstruct the two pyramids, because we know the lengths of the sides forming the bases of each, namely, ABC, formed by the three fixed points on the ground, and *a*, *b*, and *c*, the corresponding points on the photograph.

If we know the focal length of the lens used and the centre of projection, we have all the elements necessary to reconstruct the pyramid within the camera, and from it determine the apex, after which we can proceed to reconstruct the other or "map" pyramid,

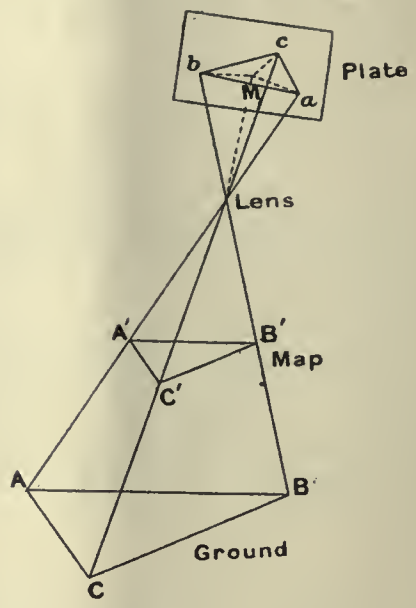


Fig. 5.

a section of which A′B′C′ parallel to the ground such that A′B′ is the map length of AB gives us the representation of the ground on the map.

The focal length of the lens being known, the centre of projection is obtained nearly enough by the intersection M of the lines joining the corners of the negative, and the lengths *a*L, *b*L, and *c*L are obtained from the right-angled triangles *a*LM, *b*LM, and *c*LM. This is done graphically as follows (see Fig. 6):—

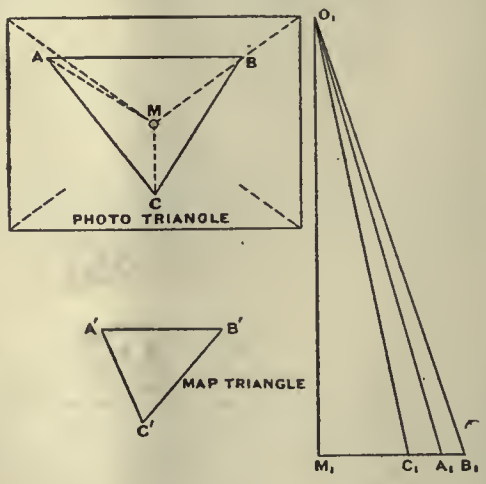


Fig. 6.

Join ABC on the photograph and the corners of the print to find M. Draw a line O_1M_1 equal to the focal length of the lens, and a line at right angles to it, along which step off MC_1, MA_1, MB_1 equal to MA, MB, MC. O_1A_1, O_1B_1, and O_1C_1 are therefore the sides LA, LB, and LC of the camera pyramid.

We can now proceed to reconstruct this pyramid on paper. To do this we must imagine the pyramid cut down the side LC, the adjacent sides opened out flat and the base folded down till all faces lie in the same plane.

The pyramid is reconstructed on this plane surface as follows (see Fig. 7):—

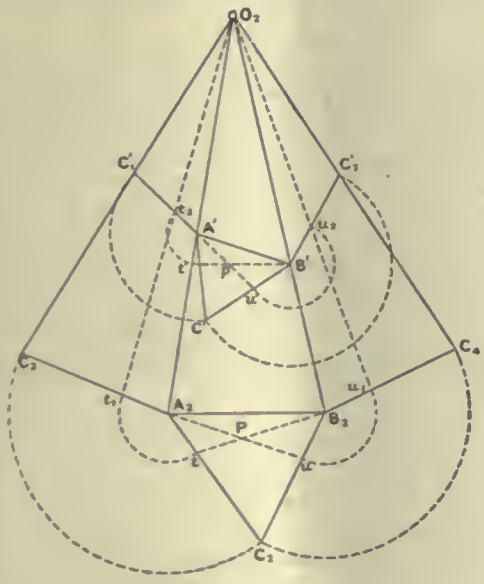


Fig. 7.

Draw a line O_2A_2 equal to O_1A_1. Then with O_2 as centre and O_1B_1 as radius, draw an arc of a circle, and from A_2 as centre and *ab* as radius draw another arc cutting the first in B_2. $O_2A_2B_2$ is the face of the pyramid L*ab*. Next draw in the base $A_2B_2C_2$, which is the triangle *abc* on the photograph. Then with O_2 as centre and radius O_1C_1 describe two arcs, one on each side of the face $O_2A_2B_2$; with A_2 as centre and A_2C_2 (or *ac*) as radius describe an arc cutting one of these in C_4, and with B_2 as centre and B_2C_2 as radius another arc cutting the other in C_3. Join O_2C_4 and O_2C_3; then $O_2C_4A_2$ and $O_2C_3B_2$ are the other two faces of the pyramid, which is now completely reconstructed.

We can now proceed to reconstruct the map pyramid LA'B'C'. We have already got the apex drawn, since it is the same as the apex of the camera pyramid, and we require to draw the base A'B'C'. The best way to do this is to draw A B on tracing-paper, and on this trace draw an arc with centre A' and radius A'C', and another arc with centre B' and radius B'C'. The intersection of these will obviously give the position of C' with respect to A'B' as the base of the required pyramid, and we require to place this base correctly on the face $O_2A_2B_2$. This is done by laying the trace over the drawing and turning it about till A' and B' lie on the lines O_2A_2 and O_2B_2 respectively, and the two arcs cut the sides O_2C_4 and O_2C_3 at equal distances from O_2. In this position the points are pricked through on to the drawing and give the positions A'B'C' on the map pyramid, the positions of C on the two sides being lettered C'_1 and C'_2.

Individual points, whether lying within or without the triangle ABC, can now be plotted as follows:—

Let P be such a point on the photograph. Join A_2P and B_2P and produce these lines to meet the opposite sides, produced, if necessary, at *u* and *t* respectively. Then with B_2 as centre and radius *bu* draw an arc cutting the side of the camera pyramid B_2C_4 at u_1, and with A_2 as centre and *at* as radius draw an arc cutting the side A_2C_3 at t_1. Join O_2t_1 and O_2u_1, cutting $A'C'_1$ and $B'C'_2$ at t_2 and u_2 respectively. Then with centre A_1 and radius $A't_2$ and centre B' and radius $B'u_2$ draw arcs cutting A C and B'C' at t' and u' respectively. Join $A'u'$ and $B't'$, and the intersection of these two lines gives *p*, the plotted position of P on the base of the map pyramid, that is, on the map.

This method of plotting is so slow and laborious that, having plotted a fourth point in this way, it is probably better and quicker to plot the rest of the photograph by one of the four-point methods already described.

The Germans apparently made use of several other methods which are extensions of or modifications of these two, and probably also photographic methods very similar to our own. Captured documents also mention a "stereo-plotter," but I do not think we have any information as to exactly what this apparatus is or how much it was used.

To turn now to the use of air photographs for showing up the shape of the ground and determining vertical relief. Though "stereoscopic" examination of air photographs has been employed for some time, certainly more than two years, I know of no instrument or apparatus, such as the stereo-comparator used in panoramic photograph surveying, which has yet been devised for accurately plotting vertical heights. I myself devoted a good deal of attention to the study of aeroplane photographs in relation to contouring, and found that though it was often possible to obtain great help from them, such help, however, could not be reduced to terms of exact measurement of height or anything in the nature of plotting. When the slopes are steep, as, for example, in the dunes along the coast or along the Mont des Cats-Kemmel Ridge, the stereoscopic use of air photographs often shows the shape of the ground very well, but to transfer the view thus obtained to the map in the form of contours, without the help of some apparatus, is more in the nature of art than exact science.

With good stereoscopic photographs in such country, it is not difficult to pick out the tops of the ridges, bottoms of the valleys, and the "peaks," which can be marked on the photographs and plotted in the usual way. This will give a very good general idea of the shape of the ground, but one cannot get the absolute height in this way or say which of two "peaks" or ridges some distance apart is the higher, and it is necessary, therefore, for drawing contours, as opposed to form-lines only, to observe as many heights as possible with a theodolite or clinometer.

On the Mont des Cats we were able to observe a number of such heights, and the resulting contours, though by no means perfect, were a great improvement on anything which had existed before; subsequent examination showed that they gave a very fair idea of the shape of the ground, and were rarely seriously inaccurate in absolute height. Apart from stereoscopic photographs, however, air photographs often give useful information as to the hydrography. In the chalk region of the Somme Valley "hanging woods" growing on the steep sides of a valley, of which "Caterpillar Wood" is a well-known and characteristic example, give a good idea of the trend of the valley bottom. In the Ypres area the valley bottoms are often revealed by the "lush" meadows, which can usually be picked out on the photographs. Tillage lines and boundaries of fields generally bear some relation to slope and drainage, which can sometimes be deduced from them.

All these points, however, are no more than indications; and though care, judgment, and experience in observing and applying them often results in a surprisingly good approximation, it cannot be said that it is yet possible to rely on an air photograph alone for anything like accurate contouring.

The contouring of maps in France interested me very much, and I put in a lot of time trying to elaborate our scanty data by examination of air photographs and other material. My printing officer used to tell me that whenever he had to print a new edition of a map I produced a new "design" for the contours. I am afraid that my "designs," in spite of the time spent on them, often came in for severe criticism. Nevertheless I must own that where the ground was suitable, and it had been possible to give the matter sufficient consideration, I thought the results distinctly good. Unfortunately the work took so long, and required so much care and caution in drawing conclusions, that time did not permit of detailed examination of more than very limited areas.

It should be remembered that in France we were working under war conditions and at high pressure, and had to do the best we could with available data and apparatus in the available time. Many of our maps could have been improved as regards the contouring if we had had more time to give to them. In using air photographs for mapping work in peace time conditions will be very much easier, and I don't doubt that our systems and methods can be greatly developed and improved, both as to the nature of the photographs and the methods of using them. The Germans,

as I have said, almost certainly employed a mechanical device for determining the amount of tilt of the camera, and it certainly does not seem to be beyond the bounds of possibility to devise means of determining the scale of a photograph with fair accuracy without the necessity of providing an elaborate framework of points fixed on the ground.

In peace time a machine need not carry an observer, machine guns, or ammunition, and more space and weight will be available to devote to improving the size and type of camera used. Very little further development, in fact, is required to give us the power, not only of preparing complete and accurate large-scale maps of civilised and highly developed regions, but also of obtaining reasonably accurate maps of unexplored regions, at present untouched and inaccessible to anyone but the explorer.

In civilised countries it is obvious that detailed survey by air photograph is a method which will give the minimum of inconvenience to the occupiers of the ground—we shall not need to invade their premises at all, while its accuracy will probably be greater than that now attained by any but the most expensive methods.

For accurate work we cannot, of course, dispense with the surveyor altogether, and in hilly country, until we can devise some satisfactory form of stereo-plotter, the air photograph will not help us very much. There does not, however, seem to be anything to prevent us making such an instrument, and when this is done it should be possible to map steep hilly regions, at present difficult to survey on account of the difficulty of getting about in them, very cheaply indeed. When it is not possible to send a surveyor over the ground to check the interpretation of the photographs, his place can be filled to some extent by the examination of "oblique" photographs taken from aeroplanes at suitable altitudes.

One may safely sum up the situation by saying that the aeroplane is already a valuable instrument for both exploration and accurate survey in flat country, and that it should not be long before its application will be almost universal, and one may venture to predict that in survey, as in many other matters, the Great War will mark the beginning of a new era.

M. N. MacLeod, D.S.O., Lieut.-Col., R.E.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Saturday, September 6.

North Middlesex Photographic Society.—Outing to the Charterhouse.
Hackney Photographic Society.—Outing to Coulsden.

Tuesday, September 9.

Hackney Photographic Society.—"Carbon Demonstration." W. Rawlings.

Thursday, September 11.

Hackney Photographic Society.—Outing to Strand-on-the-Green.
Hammersmith (Hampshire House) Photographic Society. "The Minor Sculptures of Our Churches." A. Gardner.

CROYDON CAMERA CLUB.

At the conclusion of a recent demonstration by Mr. Cecil Smyth on the making of light-filters, a member, acting of genial malice aforethought, suggested a second evening on their application to practical orthochromatism. Had Mr. Smyth realised the deadly civil war waged in the past between the members he might well have hesitated, a war recalling many bright engagements, when quarter was neither asked nor given. It eventually died down owing to sheer inanition, since when the subject has been tacitly taboo, each side respectively realising, if not openly admitting, that panchomatic and ordinary plates each have their uses and relative advantages.

Of course, there is still in the world the well-meaning enthusiast, who, possibly with limited experience, is partial to lecturing the man who does the work, familiar with all the tools available, and who knows quite well the ones he prefers for the job. Hence ordinary plates still flourish, and are still used for portraiture. From an *ex cathedra* point of view this is sad, but the sinners mourn not, and on occasion have even been known to snigger and make disrespectful allusions to the education of grandmothers in connection with the consumption of eggs.

Mr. Smyth's lecture resolved itself into a clear "blackboard" description of the action of light-filters, selective and compensating, three-colour work also being touched upon. He then resumed his seat without even a button off a glove having been thrown down as a challenge, which was distinctly disappointing. However, by specious compliments he was prevailed upon to continue, and "practical panchromatism" entered the ring. "How is it possible to render adequately a Devonshire scene with red cliffs, vivid green foliage, blue skies and cows, etc., other than by a screened panchromatic plate?" he asked, a question admirably adapted for starting a Canadian frolic; but, alas! none arose on this particular point. Miserable to relate, habitual users of "ordinary" brands weakly admitted that the panchromatic often scored heavily in pictorial photography, and so crumbled to dust a once nutritive bone of contention. The club is not what it was, Sellors notwithstanding

Nevertheless, an animated discussion followed, marked by an excellent contribution by Mr. Cavendish Morton, who preaches as well as he practises, which is saying a good deal. By easy stages he slid off the subject into that morass known as "diffusion of focus," introducing Durer and Holbein as apostles of the opposite, and then dealt with various problems relating to portraiture. Panchromatic plates and filters made no appeal to him in this branch, *nuances* and other factors being far more important. Mr. E. A. Salt denied that any normal filter existed with "*nuance*" absorption, and said he always appreciated the inherent humour of diagrams of spectral cuts. He well remembered a late member and rabid panchromatist who experimented largely with a spectroscopically adjusted red filter in landscape work. The greens were very nicely rendered indeed, even if they were not truthful transcriptions. Mr. Hunter observed he had known similar cases. Mr. Cavendish Morton agreed. Some might remember a three-colour portrait shown by him years ago at a R.P.S. exhibition. The three negatives were extraordinarily alike, and each would have rendered a good monochrome print. On the psychological side the president, Mr. J. Keane, was understood to say he preferred seeing red; certainly the reds were more important than other colours in the sense of arresting attention. This was illustrated by red roses, pillar-boxes, etc. Mr. H. King had used panchromatic plates in his studio on difficult subjects with satisfaction, but he had found freckles appeared more strongly on them than on fast "ordinary" brands. Next, please!

The evening terminated with a hearty vote of thanks to the lecturer, and a bitter complaint by a member that since the war selective absorption had been almost an unknown factor in the club. Only one brand of a certain transparent medium was obtainable, and that of miserable quality. Throughout the proceedings a distinguished visitor, Mr. J. S. Hudson (the hon. sec. of the Bournemouth Club), sat an interested and somewhat amazed spectator, especially when Mr. Cavendish Morton attempted to spank the "office boy," who had made rude remarks about "Art."

FORTHCOMING EXHIBITIONS.

September 13 to October 11.—London Salon of Photography. Hon. sec., 5a, Pall Mall East, London, W.C.1.

October 13 to November 29.—Royal Photographic Society.—Entries close September 19 (carrier), September 20 (hand). Secretary, J. McIntosh, 35, Russell Square, W.C.1.

Importation of Paper.—In accordance with the recent decision of the Government, a general authority has been issued to the Customs authorities under which all articles covered by the regulation as to the importation of paper will be admitted into this country without licence as from August 29. The Paper Import Restrictions Department at 23, Buckingham Gate, S.W.1, will close on September 6, and further communications on the subject should be addressed to the Department of Import Restrictions, 22, Carlisle Place, S.W.1.

Commercial & Legal Intelligence.

LEGAL NOTICES.—A first and final dividend of 4s. in the £ has been declared in the estate of Harry Saville Thorne, chemist and photographer, 5, Finkle Street, Selby, late 93, Sackville Street, Barnsley afterwards, 5, Finkle Street, and 26, Finkle Street, Selby, all in Yorkshire. This dividend is obtainable at the office of Geo. Hy. L. Volans, 2, Albion Place, Leeds.

NEW COMPANIES.

SELBY CHEMICAL CO., LTD.—Registered with a capital of £55,000 in £1 shares. Objects: To carry on the business of chemical manufacturers, importers, exporters, buyers, and sellers of heavy and fine chemicals, photographic and other preparations. The subscribers (each with one share) are: C. G. Mayfield, Temple Buildings, Bowlalley Lane, Hull, solicitor, and G. H. Sewards, 131, Victoria Avenue Hull, solicitor's managing clerk. Table "A" mainly applies. Qualification £100. Registered office: Holme Works, Holme Lane, Selby, E. Yorks. Private company.

N. L. SCOTT AND CO., LTD.—Registered August 22. Capital, £10,000 in £1 shares. To take over the business of manufacturers of cinematograph film stock and photographic papers carried on at 3, Pancras Lane, E.C., as "N. L. Scott and Co." The subscribers (each with one share) are:—H. G. Yorke, 31, Caversham Avenue, Palmer's Green, company secretary, and T. W. Skinner, 8, Water Lane, Ludgate Hall, E.C.4, clerk to Greenhill and Sons, Ltd. The directors are to be appointed by the subscribers. Registered office: 8, Water Lane, Ludgate Hill, E.C.4. Private company.

R. WHITE'S PHOTOGRAPHIC CO., LTD.—Registered with a capital of £500 in £1 shares. Objects: To take over the business carried on by R. White at Hill Lane, Macclesfield, Cheshire, and to carry on the business of photographers, enlargers, picture framers, dealers in photographic plates, papers, and all general photographic requisites, etc. The subscribers (each with one share) are:—B. Goodman, 55a, Great Dusie Street, Manchester, photographer, and R. White, 5, Park Street, Macclesfield, photographer. The permanent directors are B. Goodman (chairman) and R. White (managing director). Qualification: £50. Registered office: 40, Hill Lane, Macclesfield. Private company.

News and Notes.

NATIONAL PHYSICAL LABORATORY.—The Lord President of the Council has appointed Professor Joseph Ernest Petavel, D.Sc., F.R.S., M.I.Mech.E., etc., to be Director of the National Physical Laboratory in succession to Sir Richard Glazebrook, C.B., F.R.S., who retires on reaching the age limit on September 18 next.

PRESS PHOTOGRAPHIC AGENCY.—In recently mentioning this Press agency we gave its address as 170, Fleet Street, from which premises, however the Press Photographic Agency moved some two months ago to larger quarters at 3, Johnson's Court, Fleet Street, E.C.4.

PRESENTATION TO MR. A. R. OSBORNE.—A representative gathering of the Dublin photographic trade was held at Messrs. Robinson's, Westmoreland Street, for the purpose of presenting an address and testimonial to Mr. A. R. Osborne, late Irish manager of Messrs. Kodak, Ltd. Mr. Hempenstall presided, and in a witty and eloquent speech proposed the health of Mr. Osborne. Mr. J. E. Reehan, who was assisted by Mr. McCrae, who had acted as secretary, read the address, and the chairman presented Mr. Osborne with a case of Treasury notes. Tributes to the good qualities of Mr. Osborne were paid by Mr. Glenn, Mr. W. McCrae, and others. Mr. Osborne made a suitable reply.

SURPLUS AERIAL PHOTOGRAPHIC SUPPLIES.—The Board of Disposal of surplus Government property have now available for distribution itemised lists of photographic material, the bulk of which necessarily has come from the Photographic Section of the Royal Air Force. The lists specify a considerable number of aerial cameras, about 460, of which 132 are of the C type, 5 x 4 size without lenses, and 189 the L type, also 5 x 4 size, with lenses. The most important item, however, in the apparatus section is the anastigmat and other "aerial and ground" lenses to the number of 340, and of assorted focal lengths, 5, 6, 8 10, 11, 12, 14, 16, 18, 20, 25 and 30 inches. These 340 lenses are listed as one item, which fact, it may be hoped, is not intended to signify that they are to be disposed of in a single lot. Lenses are the articles of greatest utility at the present time apart from aerial photography, and their disposal in a single block necessarily eliminates the direct purchaser and passes the distribution of the instruments through a further channel, where necessarily a profit has to be taken. Other apparatus includes cameras for aerial gunnery, enlargers, optical lanterns, and a very great number of miscellaneous accessories such as dishes, printing frames, light-filters, developing tanks, dark-room lamps, and optical lanterns. A large part of the list is taken up by itemised lists of dry-plates and bromide papers for disposal. The bromide papers (which include also gaslight) show an astonishing variety of brand and grade. They include the following, each item representing a certain number of gross packets ranging in size from 5 x 4 to 25 x 25 inches:—

Criterion contrasty	Kodak special matt velvet
— gaslight	Kosmos
— Non-stress silky	Wellington carbon
— Normal	— Enammo contrasty white
— Special	— platino-matt smooth
Griffins' snow-white glossy	— rough
Illingworth contrasty R.A.F.	— S.C.P.
— glossy mauve	— S.C.P. enammo mauve
— glossy special	— slow contrasty glossy
— Ivory matt	— slow contrasty matt
Kodak Nikko mauve	Velox special
— platino-matt	— Vigorous carbon
— rough white	— Vigorous glossy

Particulars and forms of tender for these photographic goods are obtainable from the Surplus Government Property Disposal Board, Miscellaneous Stores Section, Caxton House, Tothill Street, Westminster, S.W.1.

SCIENTIFIC AND INDUSTRIAL RESEARCH.—The report of the Committee of the Privy Council which has made itself responsible for the organisation of research in a number of industries, has just been issued, and is obtainable from H.M. Stationery Office, Kingsway, W.C.2, or from the customary agents for Parliamentary papers in Manchester, Cardiff Edinburgh, and Dublin, price 6d. The report consists of an extended survey of industrial research in this country and in other parts of the Empire. It outlines certain proposed programme such as the "Records Bureau," to which we made reference last week. It contains a list of established research associations, of which the British Photographic Research Association was the first, and of the various sub-committees engaged in the examination of industrial questions. In that part of the report dealing with the formation and development of research associations special reference is made to the body representing the photographic trade, namely in the following passage:—"The British Photographic Research Association has completed its preliminary survey of the field of research, and has drafted a valuable and comprehensive scheme of work, which we think other research associations might usefully consult as an example of the way in which their plans of campaign may be attractively presented to their members. The Research Association has decided to attack the problems which confront it not only by the empirical methods which have brought the photographic industry the success it has already achieved, but also by investigating fundamental principles. This is a long-sighted view which we welcome. A number of investigations of direct industrial application have already been completed. For instance, useful experiments have been conducted on gelatine and on photographic emulsions, and a successful process which it is intended to patent, has been discovered by which it is possible to stain wood black or grey right through. This process is expected to be quite economical and suitable for use on a large scale; and it is interesting to note that the research was guided by a knowledge of the methods used in dyeing cotton. The association also makes a point of publishing all results of research which are likely to be of general interest and not of immediate use for application to specific problems of the industry."

Correspondence.

**** Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

**** We do not undertake responsibility for the opinions expressed by our correspondents.*

THE PHOTOGRAPHIC SECTION OF THE R.A.F.

To the Editors.

Gentlemen,—I have read your remarks of August 22 concerning the peace-time Photographic Section of the R.A.F. with great interest and sympathy. With much that you say I am in total agreement, but I feel that certain other of your suggestions are hardly justified.

On good authority I learn that demobilisation of the photographers of the R.A.F. has progressed so far and so rapidly that lack of men is greatly retarding much necessary work.

Again, advertisements of the sale of photographic surplus equipment have already appeared in the Press, and a great amount of material has already been sold.

Further, for military training, aeroplanes must fly and pilots must be taught to take aerial photographs. Why should not both be employed in taking photographs that will be of benefit to the country? The solution of town-planning and other reconstruction problems would be helped by good up-to-date photographic records, which would be produced more cheaply under the above scheme than by private enterprise.

In connection with aerial photographic survey, experimental work must necessarily be done under peace conditions to determine, among other things, the questions of its cost in comparison with the present survey methods.

The Ordnance Survey maps of this country, excellent as they are, are in very many instances quite twenty years out of date. R.A.F. aerial photographs could speedily be used to correct them, and few people ever suggest that the Ordnance Survey maps should be made by private enterprise.

The zeal of the photographic officers of the R.A.F. to do their work thoroughly does not, I think, indicate that they have the least desire either to burden the taxpayer unnecessarily or to trespass upon the legitimate ground of civilian effort.

Yours faithfully, F. Seyton Scott.

The Camera Club, London.

Analecta.

Extracts from our weekly and monthly contemporaries.

Arranging the Picture Directly.

It is when we come to portraiture that the greatest advantage of the direct view of the subject is most appreciated (says E. R. Hollins in "Amateur Photographer" for September 3). Before even the sitter is asked to take his place, or while in the act of doing so, the photographer should visualise the general arrangement of what he means to secure. He should so accustom himself to this preliminary conception that when the time comes to do the work he can ask his subject right away to adopt the position he requires. The mere fact that he can do so with quiet confidence will help to put his sitter at his ease, a result which will be intensified when the sitter finds that he is not asked to adopt first this position and then that while the photographer gropes for what he wants. Then when looking directly at his subject he sees it as it should be, he may introduce the camera, quickly make sure that his mental picture is included on the ground glass, focus, and expose before the model has had time to acquire any stiffness or feeling of ennui.

Answers to Correspondents.

SPECIAL NOTICE.

In consequence of general reduced supplies of paper, as the result of prohibition of the importation of much wood pulp and grass, a smaller space will be available until further notice for replies to correspondents.

Moreover, we will answer by post if stamped and addressed envelope is enclosed for reply: 5-cent. International Coupon, from readers abroad.

The full questions and answers will be printed only in the case of inquiries of general interest.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

R. M.—There are two Retail Businesses Licensing Orders, one of February, 1918, and the other of May 30, 1919. We believe there is some confusion about them, but at any rate it is clear that if your business was established on June 15 of this year you require a licence for it.

J. M. K.—The best method for toning to "sanguine" is to tone prints by the ordinary so-called sulphide process, that is bleach in a bath of ferricyanide and bromide and darken in a sulphide bath. The sepia or sulphide-toned prints are then further toned in an ordinary gold and sulphocyanide bath, as used for the toning of print-out gelatine paper. One of the best methods we know for removing yellow stain from bromide prints is to employ the iodine-cyanide reducer made very weak and used cautiously.

J. H.—(1) Try warming outside of bottle neck all round over a gas flame, and then tapping the stopper, preferably with a bit of stout glass tube; at any rate, with an article of glass. (2) Not as good. Nigrosine from Harrington Bros., Oliver's Yard, City Road, E.C.1. (3) No material harm for black prints, although it is best to keep to the maker's formulæ :for sepias by sulphide toning, too strong developer is a cause of poor tones, by causing a less thorough development of the black print.

The British Journal of Photography.

The Oldest Photographic Journal in the World.

PUBLISHED EVERY FRIDAY. Established 1854. **PRICE TWOPENCE**

TERMS OF SUBSCRIPTION, POST FREE.

United Kingdom.—One Year, 10s. 10d.; Six Months, 5s. 5d. Three Months, 2s. 9d.

Canada ... ... Australia ... ... New Zealand ... ... South Africa ... ... United States of America South America ... ... India and Far East ... ... Continent of Europe ...	*One Year.* Thirteen shillings (13s.), or 3 dollars 17 cents, or 22 francs, or 9 rupees 12 annas, or 6 yens 30 sens.
Federated Malay States, Borneo and Sarawak	5 dollars 57 cents.

Henry Greenwood & Co., Ltd., Proprietors and Publishers, 24, Wellington Street, London, W.C.2.

IMPORTANT NOTICE TO READERS.—Until further notice agents will supply the "B. J." to order only, as the high price prevailing for everything in connection with newspaper production prohibit the distribution of surplus copies for chance sales. It is therefore necessary in order to ensure the regular delivery of the "B. J." each week to place an order definitely with a dealer, newsagent or bookstall clerk, or to send a subscription to the publishers.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3097. Vol. LXVI. FRIDAY, SEPTEMBER 12, 1919. Price Twopence.

Contents.

	Page
Ex-Cathedra	525
Notes on Ordering Half-tone and Line Blocks	526
Night Photography. By Robert Dykes, F.R.P.S.	528
Practicus in the Studio. By Practicus	530
A Plea for the Ozobrome Process. By W. H. Moffitt	531
Photographic Measurement of the Intensity of Spectrum Lines	533
Para-Amino-Carvacrol—A New Developer. By Herbert A. Lobs	534
Exhibitions	535
Patent News	535
Meetings of Societies	537
News and Notes	537
Correspondence— Light for Retouching — Eye-Glass Focusing Magnifiers — The Eye-Level Reflex — The Belitski Reducer for Negatives and Bromides	538 539
Answers to Correspondents	539

SUMMARY.

In a leading article we give some advice on the ordering of half-tone and line blocks, pointing out how some economy can be effected by grouping originals together and giving a hint on getting the engraver to supply facsimile reproductions of originals which contain more or less delicate tones. (P. 526.)

In the concluding instalment of his article on night photography Mr. Robert Dykes, F.R.P.S., describes the method devised by himself for introducing interior and night subjects into cinema films so as to sustain the effect of movement. (P. 528.)

In his article this week "Practicus" deals with the alternative systems, of blinds and curtains, for the control of the light in a studio. (P. 530.)

An Australian writer, Mr. W. H. Moffitt, has sought to simplify the working instructions for the Ozobrome process. He gives formulæ for making the pigmenting and acid bath. (P. 531.)

The Professional Photographers' Association is advertising for a paid secretary. (P. 525.)

An exhibition of "straight photographs" by Mr. Ward Muir is now being held by the London Camera Club. (P. 535.)

Two inventions in colour photography, for which large claims are made, have obtained some publicity in the daily Press. (P. 537.)

Apparatus for aerial stereoscopic photography and a modified composition for the true-to-scale process figure under "Patent News" (P. 535.)

A correspondent, Mr. A. Palfreyman, strongly objects to criticisms of the reflex camera on the ground of its unsuitability for use at eye level, and describes and illustrates the special hood, fitted with a mirror, which he employs for using the reflex in this position. (P. 538.)

Mr. Harold Baker expresses his good opinion of the Belitski reducer for negatives and prints. (P. 539.)

The Colour Laboratory of the United States Bureau of Chemistry has prepared a new developer, paramino-carvacrol, made from cymene. (P. 534.)

Professor J. W. Nicholson, F.R.S., has recently described a photographic method for the measurement of the intensity of spectrum lines (P. 533.)

Methods which have been used for producing, by optical means, a background (of any subject) in a portrait are the subject of a paragraph on page 525.

The present time—namely, a few weeks before the termination of "daylight saving"—is a fitting one in which to carry out any renovation of artificial-light equipment. (P. 526.)

Two reducers serve well for remedying over-printed and gold-toned P.O.P. prints. They are ammonium persulphate and the mixture of ferricyanide and sulphocyanide known as Haddon's reducer. (P. 526.)

EX-CATHEDRA.

Paid Secretary for the P.P.A. The announcement which appears on another page under "Situations Vacant" signifies a policy on the part of the Professional Photographers' Association which perhaps many members of the P.P.A. have anticipated. It is now proposed to appoint a paid secretary of the Association to undertake routine business, to produce the P.P.A. Circular, and to carry out the organisation of the annual congress. Mr. S. H. Fry, who undertook the duties of honorary secretary some few months ago, did so, it will be remembered, on the understanding that he should occupy that office only for a twelve-month; so that it may be assumed that the step now being taken is for the purpose of stabilising the secretarial management of the P.P.A. and of preparing the Association for such developments as the future may have in store for it. It is obvious from the wording of the Association's advertisement that a professional photographer who is, or has been, in business for himself is required, and it can be understood that the result of the appointment will be watched with no little interest by those who take a long view of the influence of the Association in the photographic world. For while the policy of the P.P.A. will continue to be that of the council, a large responsibility for its effective administration, and even for the lines along which it shall work, will rest with the secretary.

Natural Backgrounds. Our paragraph of August 22 on Mr. Elwin Neame's invention has brought us one or two inquiries as to the methods employed by previous inventors of systems for producing the same description of effect. Without wishing to suggest that there is anything in common between these and that of Mr. Neame's, we may say briefly what they are, or rather were, for, so far as we know, they have never come into regular use. The method of Tilley consisted in mounting a positive transparency of the background subject in a hinged frame placed within the camera so that, by an outside lever, it could be pressed against the plate. The sitter was first photographed against a dead black background under the ordinary lighting, the positive transparency in the camera being turned down out of the way. Then, without any movement of the sitter, the black background was drawn up and a white translucent one let down. At the same time the lighting previously used was cut off and the white background illuminated from behind. The background transparency in the camera was also raised to bring it close in front of the plate. On a second exposure being made under these conditions the background was impressed upon the plate by contact printing except where the projected dark silhouette, so to speak, of the sitter formed an unilluminated area in the focal plane. The outline of the sitter, in other words, was caused to form a kind of optical mask for cutting out just that portion of the background

which otherwise would have overrun the image of the sitter made at the first exposure. Dischner's method was almost identical with this except that it was better adapted to artificial illumination, and he, of course, used dry-plates, whereas Tilley's process was carried out under the handicap of the wet-collodion plate. The method of Sontag, to which we also referred, was much simpler, and consisted merely in placing the sitter against a translucent screen on to which the background was projected by means of an optical lantern placed behind it. The feature specially claimed for Sontag's invention consisted in making the translucent screen of non-actinic colour.

* * *

For Artificial Light. The holiday season is nearing its end; in a few weeks "summer time" will be no more, and we shall find that although on one afternoon we may be able to work up to four o'clock, on the next we shall be no better off at three, and all by Act of Parliament. Trade is still dislocated, manufacturing is sluggish, and the question of imports seems as far from settlement as ever. To come from the general to the particular, this means that photographers will shortly need their electric-light installations, and that the supplies of lamps and material are still far from normal. It is, therefore, desirable that installations should be overhauled so that any fittings or material needed should be ordered at once: that the almost inevitable delay causes the least possible inconvenience. Among the jobs which may be advantageously put in hand are the cleaning and adjustment of arc lamps and the ordering of any necessary spares in the shape of glasses and carbons, the re-whitening of reflectors, the cleaning or renewal of diffusers, and the examination and cleaning of switches, contacts, and the like. Even half-watt installations will not run for ever without a little attention. The bulbs lose much of their actinic power before the filaments actually break, and it is false economy to delay renewal till this happens. It must not be forgotten that not only the inside but the outside of electric bulbs becomes coated with dirt which becomes baked on and defies ordinary wiping. This may be removed by rubbing with methylated spirit to which a little ammonia has been added.

* * *

Reducing P.O.P. Prints. Perhaps we may permit ourselves to supplement a remark of our contributor, "Practicus," recently to the effect that he was unable to recommend any preparation or formula for reducing the depth of gold-toned P.O.P. prints which had been printed too dark. In our experience the persulphate reducer is one which works excellently for this purpose. If our contributor's view is that no reducer can be used on an over-printed toned P.O.P. print without affecting its colour, then we are bound to agree with him, but at the same time the persulphate reducer, while readily effecting the required reduction in depth, alters the colour of the print rather favourably than otherwise. It is some years now since we used it, but we still clearly recollect the excellent tone, something in the direction of a cold black, which is produced by it. Another reducer which has a very similar action, and in our experience is quite satisfactory in use, is that worked out by Mr. Haddon, and consisting of about 10 grs. of potassium ferricyanide and 20 grs. of ammonium sulphocyanide dissolved in 4 or 5 ozs. of water. It cannot be denied that these reducers are inadequate when the object is to reduce, say, one of a dozen prints in order that the whole lot may be identical, but they have their use in cases where a single print is being made and where a mistake in printing, unless it can be rectified, may lead to some considerable loss of time in taking a second impression from the negative.

Fallacies. The lack of knowledge of its first principles is, as many of us have reason to know, a distinguishing feature of many people who have to do with photography. For our sins we were condemned the other day to the long and ungrateful task of trying to prove to the enthusiastic inventor of a camera accessory that the mere device of attaching a finder to the lens did nothing towards showing the alteration of the picture on the plate when the lens was raised or lowered in relation to the latter. Failing the opportunity of ocular demonstration, the attempt was fruitless, but perhaps specific mention of the fact "in print" somewhere may bring conviction of the error to our enthusiastic visitor. Within a few hours of this incident we heard of a photographer of some experience gravely recommending the stopping-down of the lens employed in enlarging for the purpose of securing sharp enlargements of negatives which are out of focus. Cases such as this force one to the uncomfortable conclusion that many people get a knowledge of photography in a parrot kind of way by assimilating isolated items of information without acquiring any real understanding knowledge of the elementary principles which are concerned in the formation of an image by a lens. In the absence of the desire or aptitude to come to such an understanding, apparently the most excellent of text-books are useless to them.

NOTES ON ORDERING HALF-TONE AND LINE BLOCKS.

PHOTOGRAPHERS who have occasion to purchase photo-engraved blocks for their own use or often for that of their customers are perhaps, many of them, none too fully informed as to many of the points concerned in the supply of these articles as a condition of securing the best technical results, and of avoiding unnecessary charges. Like a host of other commodities the price of half-tone and line blocks has very greatly advanced during the last five years. Whereas half-tone work could be bought before the war at the price of 5d. per inch, and from some engravers for considerably less, the minimum charge for copper half-tones adopted by the Federation of Master Process Engravers is now 10½d. per inch, to which must be added correspondingly increased charges for such extras as are commonly required in buying blocks. While photo-engraving in pre-war days was the subject of a good deal of "cutting," it may be thought that process houses by combining together have very fully covered themselves in respect to the increases in materials and labour, the latter the chief cost in the making of blocks. Therefore, some notes on the ordering and purchasing of engraving work may perhaps be of value to many readers in the way of saving expense on some items, and in avoiding disputes arising from the necessity of re-making plates which are judged unsatisfactory.

The question which immediately arises is the kind of print which will yield the best half-tone block. Opinion is still somewhat divided, but it may be said that for fine half-tone work which is to be printed on an art-surface paper a well-toned P.O.P. print is probably the best form of original. Nevertheless, a bromide or gaslight print of semi-glossy surface, a surface such as that of the Wellington "Carbon" bromide, runs it very close. Even so, there is no need to dismiss a print of fine matt surface as unsuitable for a half-tone original; we have had some of the finest blocks which have passed through our hands from dead matt platinotypes and platino-matt bromides. Despite the fact that the glazed bromide is largely in favour for half-tones to be used in newspaper printing,

we are of the opinion that any of the foregoing descriptions of print are better than stripped bromides for the finer grade of half-tone required for printing on art paper. Where the subject lends itself to it, for example, in the case of photographs of buildings, it should not be forgotten that a greatly improved half-tone results from a little judicious strengthening of the contrast of the print by working up in crayon powder or by other means. The half-tone process has a somewhat flattening effect upon contrast, due to the fact that the highest light in a half-tone impression must be a tint due to the most open dot pattern formed on the plate. This effect can be compensated for fairly well by a corresponding strengthening of the darker tones in the original. It does not require much experience to be able to judge of the degree of flattening which the reproduction in half-tone causes, and to allow for it in advance. It is much better to do this than to give a somewhat vague instruction to the engraver to "brighten up the original a little."

The print should be somewhat larger than the half-tone block is to be. While it is quite practicable to make a half-tone the same size as the original or even to enlarge to some extent in making it, photo-engravers are accustomed to work upon a moderate scale of reduction in making their half-tone negatives. This degree of reduction may be put as about two-thirds scale, that is to say the original for a block which is to measure 4 inches should be about 6 inches. To avoid confusion, the back of the print should be plainly marked with the dimension which the half-tone is to have. Mistakes are often caused by instructions to make a block "half-size" or to reduce "two-thirds," because there is the opportunity to mix up size and scale. For example, a 4 by 3 block from an 8 by 6 original is quarter-size but only half-scale. By giving always actual dimensions this source of error is eliminated. Also, where several quite small blocks are required, economy may be effected by ordering them to be reduced together in making the half-tone negative and the engraved plate from it, the plate being then cut up and the portions separately mounted. At the present time photo-engravers charge 12s. 3d. for what they call the "minimum" size of block, namely, one of 14 square inches. Any single block smaller than this is charged the full 12s. 3d., so that if several little blocks measuring, say, 2 by 3 inches have to be made, it is economy to prepare them of such size that they can be reduced together to give blocks of the required dimensions. There is a limit to this economy, since engravers now agree to charge sixpence for the cutting out and separate mounting of each plate which they prepare in the first instance from several originals in this way. Moreover, the best results cannot be expected unless the originals are of similar tone or colour; it is useless to order the reduction of a black and a sepia print together, one or the other is bound to suffer. In ordering blocks to be reduced together in this way the proper plan is to mark a dimension on one only, which may be called A, and to pencil on the others "reduce with A and cut," or "with A, as it comes." The accompanying order should be written in a corresponding manner, for example:—

1 half-tone marked A	← 3 ins. →	
1 ,, ,, B	Reduce together and cut.	
1 ,, ,, C		
1 ,, ,, D		

In exceptional cases it may be necessary to order a block of size just to fit in a given space. Here it must not be forgotten that the bevelled mount of the block, or the "beard," as printers call it, averages about one-eighth of an inch all round, so that the whole block as a rule is a little more than one-quarter inch larger each way than the picture on it.

A further point in ordering blocks is the ruling of the screen used in making them. For general work on art paper or for good qualities of esparto and other calendered papers the best screen ruling ranges from 133 to 150 lines per inch. Almost without exception it will be found that 133 lines per inch is quite sufficiently fine. Blocks made with finer screens are more difficult to print, and therefore in the end may give a worse result than those from screens of coarser ruling. For the poorer classes of paper, such as used for newspapers, screens of greater coarseness from, say, 100 to 85 lines per inch are used, but these will be rarely wanted by the photographer except for the purposes of advertising in local newspapers, in regard to which it requires to be said that the reproduction in the best circumstances is never likely to do anything like justice to the original photograph.

Half-tone blocks are finished off by photo-engravers in various ways. It is the common practice to put a rule or line round the picture. Most engravers do this without it being ordered, but we think any half-tone engraving which is supposed to have any claim to pictorial merit looks much better without it. If it is not required, the fact should be separately indicated on the order by the words "no rule." Another variety of finish is that of cutting away the background of a subject on the block so that the subject appears, when printed, against the white paper instead of against the half-tone tint or any design of background which might have been in the original. This "routing," as it is termed, is charged at a somewhat higher rate per inch, as is also the vignetting of a subject on the block. A further form of extra work which the engraver does (and charges for) is "piercing," that is perforating both the wood and the metal of a multiple block for the purpose of providing space for the insertion of type.

Before we leave the considerations of half-tones there is one point which requires to be explained to those who set any store by the correct tonal reproduction of their originals. It applies particularly to work in a high key and to any prints the tones and gradations in which are delicate. This is the question of "fine etching," which is the retouching work which the artists' department of a photo-engraving shop carries out by covering parts of the engraved plate with an etch-proof varnish and then giving the portions which are left uncovered a further etching. In our opinion, formed from a twenty years' experience in ordering half-tone engravings, this fine etching is the bane of the half-tone process when a facsimile reproduction of tones is concerned. We know too well what the fine etcher can do towards "improving" the block. His improvements are very often done to remedy defects in the photographic part of the process, that is to say, in the making of the screen negative from which the engraved plate is printed, and we have seen for ourselves the extent to which the fine etcher will falsify the tones in a reproduction and even outlines themselves, as, for example, cloud forms in a sky. But the practice is so firmly established in the photo-engraving trade that there is no prospect of getting rid of it, although it has been shown that the half-tone block is able to give an almost facsimile reproduction without any fine etching whatever. We make these remarks for the benefit of photographers having the occasion to order half-tones which shall reproduce as correctly as possible the tonal values of the original. In these circumstances it is advisable to instruct the engraver to omit fine etching altogether. When, as is almost certain to be the case, he says that he cannot, the reply should be that fine etching is to be done to the very minimum extent. Photo-engraving establishments vary in their ability to give

facsimile results, but a little experience of block-makers will enable the purchaser to place his custom with one which depends more largely on the photographic work than upon the touching-up of the fine etcher. As regards half-tones, a final word requires to be said, by way of caution, that the effect shown by the proof supplied by the engraver cannot be expected to be repeated in as high a quality when the job is printed. Allowance must be made for the superiority of the etcher's proof over the impression which the printer of a booklet or circular is likely to give.

Line blocks are less frequently needed by photographers, and may be briefly dismissed by saying that proper quality of the original—that is, solid black lines on white board—is more important than is that of the original for half-tones. On the other hand, makers of good line blocks are more difficult to find than those of half-tones. As regards the economy in making several small line blocks together, the observations already made under half-tone apply equally. Apart from such line blocks as a photographer may use for newspaper advertising, his chief demand for them is likely to be in the way of composite blocks containing both line and half-tone, for example, the half-tone reproductions of some photographs interspersed or surrounded with decorative work in line. This is a regular product of the photo-engraver, and some most effective work of this kind can be obtained.

NIGHT PHOTOGRAPHY.

[Perhaps no branch of outdoor photography offers so great a degree of attractiveness as that of outdoor scenes under artificial illumination, particularly to those in large cities where an abundance of subjects of this kind is available. Since the immediately forthcoming season is the best time of year for night photography we take the opportunity of publishing a comprehensive practical article on the subject by an expert in it of long experience, Mr. Robert Dykes, F.R.P.S., formerly senior scientific assistant to the late Sir John Murray, K.C.B., F.R.S., and of the North Sea Fishery Investigations. Part of these notes appeared in a manual on night photography by Mr. Dykes, issued some years ago by Messrs. Dawbarn and Ward, but long out of print. In this final instalment Mr. Dykes describes a method of introducing night and interior subjects into cinematograph films.—Ed. "B.J."]

(*Continued from page 518.*)

Methods of Obtaining Cinematograph Night Effects.

For the benefit of those readers who have not used, or do not understand the mechanics of, cinematography a brief outline of the movements may be an advantage. The cinematograph is simply a glorified form of snap-shot camera, which takes single pictures on a continuous ribbon of film, each little picture being perfect in itself and measuring about one inch wide by three-quarters of an inch high, so that at all times and for all subjects the height must be accommodated within the three-quarters of an inch, there being no vertical or horizontal positions for picture-taking as in the ordinary camera. Neither is there a swing-back, hence the frequent distortions in cinematograph pictures through too much use of the tilting-table and bad camera setting.

Continuous movement of the film past the lens, without a pause would give a blurred image, similar to the effect obtained when, in taking ordinary photographs, the camera is moved during exposure. To overcome this difficulty in the cinematograph camera the film or negative stock is fed intermittently behind the lens, through a pressure gate, by special gear, which feeds with a quick, jerky motion. The recognised rate of speed to obtain almost natural movements of the objects photographed when projected upon the screen has been found to be one foot of film to the second, there being sixteen pictures in each foot of film. The camera handle is given two complete turns per second, so that it will be understood that each single picture is taken at an exposure of about 1-45th of a second, there being a corresponding period of time for the shutter to cut off the light, whilst the intermittent gear brings a fresh portion of cinematograph film into position ready for exposure. The sector of the shutter may be opened or closed, to increase or decrease the exposure, but the general exposure is 1-45th of a second.

The intermittent motion of the film is obtained by means of a claw escapement worked by an eccentric movement, the two claws engaging in the sprocket-holes or perforations on each side of the film stock, and as the closed portion of the circular shutter working between the lens and the film cuts off the light these claws draw the film downwards three-quarters of an inch, disengage, and as the open sector of the shutter travels across the film giving the exposure, the two claws travel upwards three-quarters of an inch, then forwards, and, as the open sector of the shutter passes out, they engage the sprocket-holes of the film and bring down another three-quarters of an inch of unexposed film. By this means a steady, intermittent movement is kept up, the film running from a magazine holding rolls of from 50 feet to 400 feet, according to type of camera. As the film leaves the magazine it passes under a jockey roller, then between rollers and a sprocket-wheel into the gate over *skates* or *runners*, kept gently but firmly in position by springs. On leaving the gate, the film again passes under a sprocket-wheel over rollers, under a jockey roller, and into the take-up box, which is exactly similar to the magazine and interchangeable. The gate carries the "mask," a small, highly burnished plate of gun-metal or steel having a square cut opening about one inch wide by three-quarters of an inch high. These masks vary slightly in different cameras, and it is essential that films made up for projection should always have the same masking.

With these few particulars about cinematograph camera movements my readers will readily understand that certain subjects are next to impossible in cinematography. Some cine-cameras are specially geared for trick work, etc. A separate low gear enables the operator to take single pictures per one turn of the handle at any desired exposure.

It may be mentioned briefly that variations in speed of taking are introduced at times for certain purposes. The regular speed of handle turning to give fairly correct animation has been found to be about two turns of the handle per second, which gives the sixteen pictures to the foot. If the handle is slowed up, moving objects photographed, such as a man walking at a moderate pace, will appear to move much faster and will do so in more or less spasmodic jumps, the number of single pictures taken not having been sufficient to deceive the eye and give the apparent natural gait. If, on the other hand, the handle is run too quickly too many pictures may be taken to show the natural gait, and the result is a heaviness of movement or exaggerated slowness very frequently seen in topical pictures of soldiers on the march, the operator having raced or kept time to the band. Motor-cars scooting up roads and hopping round corners is done by slow handle-turning, and high jumps and other rapid movements showing slowness are

done by high-speed handle-turning on specially geared machines taking forty pictures and over to the second, and projection on the screen at the ordinary speed.

When a cinematograph film is projected upon the screen there are as many gaps or periods of blank as there are pictures, but unless we introduce a special means of detecting them the eye is deceived by what has been termed the persistence of vision, an optical illusion easily illustrated by watching someone rapidly whirl a red-hot poker or a lighted torch round his head, when an apparently continuous circle of light is observed, though it is obvious that the poker or torch can only be in one spot at a time. Persistence of vision, or optical continuity, fills up the gap.

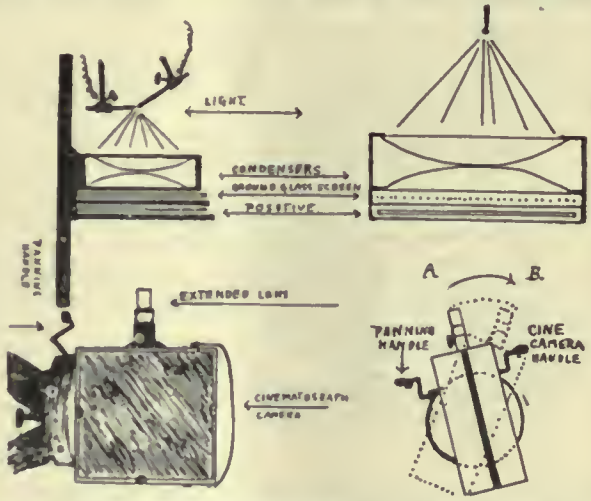
It is this deception the optic nerve plays upon the brain that gives us the impression of continuous movement in the figures or objects projected upon the cinematograph screen. The effect is killed by broadening the gap between each picture by means of a white line space between each separate picture. The film on projection then becomes a series of "stills," or ordinary lantern-slide type of picture that fail to coalesce, no matter at what speed they may be projected, and are therefore without animation. The brain is more susceptible to white than black, and the white space between the pictures completely destroys the illusion. It is possible therefore to realise the fact that there is a gap between each single cinematograph picture of about the same length of time as that occupied by the picture on the screen. Therefore, when we go to see the pictures at a cine. show we see nothing half the time, but we do not know it—shure, but 'tis a dirthy thrick that our sinses play us.

For picture purposes the shortest length of film that one can use without it simply being a flash, is eight or ten feet, equivalent to 10 x 16, or 160 single pictures. With a shorter length of film than this the picture would be on and off the screen without allowing sufficient time for viewing. This makes it a matter of impossibility to include such scenes as cathedral interiors and night effects without taking them by studio methods of lighting, *i.e.*, the introduction of arc lamps or mercury-vapour tubes By the ordinary lighting in a cathedral or a street scene by night, even were we to use the trick handle of the cinematograph camera and expose one picture per turn at the required exposure, it would take, as a general rule, a considerable length of time, with consequent fluctuations of light and other difficulties. Consider cinematographing Edward the Confessor's Tomb in Westminster Abbey without panoraming. It would be a direct still life length of film of twelve feet (12 x 16) or 192 single pictures at an exposure of forty minutes per picture on the film stock (200 H. and D.: lens aperture *f* 3.5), *or one hundred and twenty-eight hours' handle turning.* Scenic, or travel pictures, therefore, have been limited to pure outdoor subjects, and in making a travel film of a cathedral town an operator had to confine his attentions simply to exterior views of the cathedral or other interesting buildings.

It is impossible in a picture theatre for the operator to stop running his film for the purpose of projecting ordinary lantern slides on the screen showing interiors. Therefore, to make scenic and travel films more interesting and complete, the following method was tried by the writer with great success, and will enable an operator to introduce lengths of cinematograph film negative of both night effects and cathedral interiors into his ordinary film negative taken direct with the cinematograph camera. In the first place, this method is simply a copying process, and ordinary plate negatives must be taken first. Films are of no use, as they will not enlarge satisfactorily without showing the grain of the celluloid base. The type of negative selected for conversion into movies must not contain moving objects, such as life, smoke, or clouds, unless the subject is of the greatest importance and unobtainable by direct cinematographic means. The only animation we can introduce into these travel stills is a panoramic movement, moving generally from left to right or up and down as in some cathedral views. If any form of life were in the negative to be copied it would require to be on the extreme edge, where one would immediately panoram off it, otherwise the figure or figures would look like models in a waxwork show. The best size of plate to use is from half-plate upwards or, if using quarter-plates, to enlarge up to half-plate or larger. A transparency is made either by contact or enlarging, and this is copied by the cinematograph camera on to cinematograph film-negative stock. A half-plate transparency if panorammed across from left to right of the length of the plate will yield according to distance of transparency from cinematograph lens a length of film negative of from eight to fifteen feet.

The transparency is mounted in a carrier, which may be geared to move absolutely steadily across the front of the cinematograph lens from right to left by means of a ratchet turned by a handle and so threaded that the plate may be moved sufficiently slowly to allow of the required length of film negative being taken. This carrier may be very simple in construction or elaborated into a series of horizontal and vertical movements controlled by the cinematograph camera itself by suitable gearing. *One thing absolutely essential is perfect steadiness of movement.* To simplify matters the cinematograph camera may be panorammed across the transparency by means of the ordinary panoram gear attached to all cinematograph tripods.

The ciné pictures of Stockholm, Sweden, from the Katarina Hissin, and others, reproduced August 22, were copied in this way, and are perfectly steady when projected on the screen. They were copied by means of the slow handle at about four pictures to the second with a three-inch lens five inches from plate and stopped down to *f*/11. The lens tube of a ciné camera is as a general rule of sufficient length to allow of focussing up



closely, but if not it is a simple matter to increase the length by introducing a short piece of tube. In panoramming with the ciné camera the lens moves through a small angle, but as the lens is of such short focus this angle is inappreciable.

The transparency for copying is lighted by any suitable means such as daylight, incandescent gas, acetylene, or a small arc through a condenser sufficiently large to cover the size of transparency to be copied and a ground-glass screen to equalise the light (see diagram). By this method, providing the handle-turning is steady, the exposure right, and the light good, a length of film negative of superior quality may be obtained that, when joined up in the real ciné film, will give just that suggestion of movement that is required for cinematograph pictures.

It makes a travel film much more interesting and complete if

we can introduce interesting subject matter that may be of historical value, such as the spot where Thomas à Becket was assassinated in Canterbury Cathedral, one spot that has made the old cathedral famous and brought many thousands of pilgrims from all parts of the world to see.

A year or two before the war the writer introduced some of his experiments into a film of Winchester, showing the nave, choir stalls, screen, etc.—three short lengths of novelty—and increased the interest in the film very considerably. They were judiciously sandwiched in and did not total more than forty feet.

If we desire to introduce more animation and suggestion of life into cinematograph pictures by night as in the case of picture-play work, where it may be desirous to introduce a street scene by night it will be necessary to adopt American methods as carried out at Universal City (a cinematograph town), Los Angeles, where real street settings are arranged and lighted by quartz mercury-vapour lamps. There is another method, but a very tedious and difficult one that, as far as the writer is aware, has not been used, though some people claim to have carried it out, in all probability assisted by mercury vapour lighting and "spot lights." The idea is to expose doubly, first, on your characters in the scene against a dead black background so arranged that when the film is exposed or runs through on the street scene by night, the characters in the setting occupy a dark part of the picture, *where no lights can shine through them.* The writer carried out a series of experiments some few years ago with the ciné camera at night in the West End of London, and the results were both interesting and very funny. The exposures made were with the usual film stock (200 H. and D.), and a lens working at full aperture ($f/3.5$) on the high gear or ordinary handle turning 1-30th to 1-40th of a second, and on the low gear or trick handle at from four pictures a second or ¼ second exposures to five seconds a picture. The best results were obtained by the longest exposures, but in such scenes as Piccadilly Circus the results were too funny to be used seriously owing to the movement. The traffic trafficked and the policeman on point duty did a week's work in a couple of minutes. 'Buses were pushing each other up Shaftesbury Avenue, and ..nings were "verra thick." The effect was much as a West-Ender may have seen it in pre-war days after having dined too well but not too wisely. As before explained, this effect was due to not obtaining the required number of pictures per second to give the apparent natural movement.

I will close these notes on the cinematograph in the hope that it may be found of use to amateur cinematographers, and that it may lead to bettering the output of educational and travel films—a somewhat neglected branch of the industry, but of great promise in the near future.

ROBERT DYKES, F.R.P.S.

PRACTICUS IN THE STUDIO.

[Previous articles of this series, in which the aim of the writer is to communicate items of a long experience in studio portraiture, have appeared weekly since the beginning of the present year. It is not thought possible to continue the series to the length of that by the same writer which ran through the "British Journal" some years ago, but if any reader among the younger generation of photographers, and particularly those engaged as assistants, has a particular subject which might be dealt with, his or her suggestion will be welcomed. The subjects of the previous articles of the series have been as follows:—

A Talk About Lighting (Jan. 3).
The Camera and the Lens (Jan. 10).
Managing the Sitter (Jan. 17).
Backgrounds (Jan. 24).
Studio Exposures (Jan. 31).
Artificial Lighting (Feb. 7).
Printing Processes for Portraiture (Feb. 14).
Studio Accessories and Furniture (Feb. 21).
The Surroundings of the Studio (Feb. 28).
Studio Heating and Ventilation (March 7).
The Postcard Studio (March 14).
The Printing-Room (March 21).
About the Reception Room (March 28).
Home Portraiture (April 4).
Portable Studios (April 11).
Copying (April 18).
Handling the Studio Camera (April 25).
More About Lenses (May 2).
Enlargements (May 9).
Advertising the Studio (May 16).
Mounts and Mounting (May 23).
Business Methods (May 30).
Photographing Children (June 6).
Portraits of Elderly People (June 13).
Something about Lenses (June 20).
Hand Cameras for Professionals (June 27).
The Dark-Room and Its Fittings (July 4).
Plates and Their Work (July 11).
Apparatus Repairs and Renovations (July 18).
Posing the Head (July 25).
Intensifying Portrait Negatives (Aug. 1).
Workshop Jobs (August 8).
The Personal Factor (Aug. 15).
The Keeping of Negatives (Aug. 22).
Reduction of Negatives and Prints (Aug. 29.)
Leaky Roofs (Sept. 5).

BLINDS AND CURTAINS.

ALTHOUGH in previous articles I have touched upon the use of blinds and curtains for studio portraiture, I have not discussed the pros and cons of the various methods of light-control in general use.

Putting aside for the moment portable shading appliances, we may consider that there are two systems to be considered—roller blinds of the usual type and festoon curtains. Each of these systems has its supporters, and practically the same effects of lighting can be obtained with either. The main points of difference are found in the cost of installation and repairs, the ease of working, and, in a lesser degree, the appearance when fixed.

Most writers upon studio construction and fitting seem to favour roller blinds, perhaps because they have been more familiar with them than with curtains. I confess I do not share this view, but I am quite willing to state the case for blinds as fairly as possible. It is usual to have two complete sets of blinds: one set of dark green or very dark blue and the other of pure white. The material in each case is good quality "blind holland." There may be a temptation to use tracing cloth for the white set, but this should be sternly repelled, as tracing cloth becomes very brittle with exposure to the light, and tears and splits in all directions. Good holland does not behave in this way, and, moreover, can be washed and re-stiffened when soiled. The edges must be hemmed to give additional strength, as the pull of the springs is necessarily strong. Below each roof blind two strong guide wires must be fixed to prevent sagging. Overlap of five or six inches must be allowed, so that oblique streaks of light may not fall upon the sitter.

We have now to consider the width of each blind. For a studio 28 feet in length, and entirely covered with glass, H. P. Robinson recommends six blinds, each 4 feet 8 inches wide; but

this seems to me to be too wide, as the raising or lowering of even one blind of this width may alter the lighting to a greater extent than is desired. On the other hand, narrower blinds mean a greater number of rollers and a complexity of wires and strings for managing them. Modern studios, however, have usually less glass to cover, and I should prefer blinds 42 inches wide, five of which would be sufficient for a run of about 15 feet, allowing for overlap. The rollers must be of stout tin with good springs and ratchets, as the cheap wooden rollers are not strong enough for this work, and the ratchets are not reliable. The cords must run over brass pulleys fixed at the eaves and be secured by cleats at a convenient height from the ground. Naturally the dark blinds will be fitted with dark cords and the white blinds with light ones, or endless confusion will result. The side blinds must correspond in width and number with those of the roof, and their rollers must be fixed at the bottom of the windows, the cords passing over pulleys at the eaves and secured to another set of cleats. This gives twenty strings to look after in a range of five blind widths.

As long as the blinds continue in good working order there is no fault to be found with this arrangement; but as soon as the springs begin to weaken or the blinds acquire a habit of running unevenly the trouble begins, and there is considerable difficulty in putting matters right. This is usually due to the common practice of leaving the blinds down when not in use. If all the strings are released and the blinds allowed to roll up during the night, the springs will retain their resiliency and the blinds will run more truly, besides which the rotting effect of the light upon the material will be reduced to the minimum.

The festoon curtain system is equally efficacious in use and much simpler and cheaper in construction. It calls only for four wires stretched tightly from end to end of the studio, upon which the curtains run, both dark and light blinds running upon the same wires. The top wire should be fixed as near the ridge as possible and a little beyond the centre beam, so that no light can creep over the top of the blinds. If this be not possible about six inches of the glass should be obscured with dark paint which will serve the same purpose. The length of the curtains will depend upon the length of the glass to be covered. In most studios two rows of curtains will be sufficient, so that each will be half the length of the glass, allowing also for an overlap of six inches. The third wire, which supports the top of the second row of curtains, should not be in the same plane with the other three, but about five inches lower, so as to allow of the two rows being moved to and fro without fouling each other. The wires should be of galvanised iron, which will not corrode like plain iron or steel, nor perish like brass. Copper is too soft, and will give under the strain. The curtain rings should be about three-quarters of an inch in diameter, so that they will slip over the straining bolts without having to untwist the wire. They should be sewn about 5 inches apart on to a strong linen tape which is firmly stitched to the hem of the curtain. Enough black or dark curtains should be provided to cover the glass entirely, and in the centre there should be enough white curtains to cover half the length of the glass.

The side blinds hardly need description, as they are fitted in two rows exactly as for an ordinary window. The arrangement and proportion of black and white is the same as for the roof. Sketches showing the general arrangement will be found in the "Portrait Studio." The best tool for manipulating the blinds is a bamboo cane fitted with a large cork ball at the top, This will give a good hold on the material without risk of tearing.

The size of the studio has an important bearing upon the effect of the blinds, a little modification of the latter altering the lighting to a much greater extent in a small studio than in a large one. In fact, in a very large and lofty studio it is often necessary to provide a portable arrangement of curtains which can be brought close up to the sitter when any decided effect of lighting is desired. I recall one studio of such immense proportions that the only possible means of controlling the light was to block out everything but one side window, which was used as a high side light in the manner of Robinson's "studio of the future." The studio in question is now one of the past as far as photography is concerned. The idea of using a portable curtain carrier originated, I believe, with the late Robert Slingsby, who had to contend with a high-roofed studio. A convenient arrangement is a frame about six feet wide and seven feet high fixed upon feet similar to those of a background. On the top of this frame is fixed another about three feet wide at an angle of about 35 degrees from the horizontal. On the upright frame are two rows of curtains of nainsook or nun's veiling running on wires, while the top frame has one row, similarly fixed. If desired, the top frame may be hinged and fitted with a clamping arrangement so that the angle can be varied. With this simple appliance some charming and distinctive effects of lighting can be obtained with very much less trouble than with the ordinary fixed blinds; in fact, I have worked the day through without having to touch the large studio blinds at all. In the case of electric-light work where the ordinary blinds cannot be used, this screen is invaluable and allows of much better control than is possible with any other system I have tried. If it be found necessary, it is, of course, possible to add dark blinds by hooking them on to the wires.

In very small studios where there would be no room for this screen, the sitter is nearer the light, and control is easily obtained by the blinds. I recommend in addition an ordinary circular head screen, which should be covered with thin muslin. The lawn usually fitted is rather too thin, while calico or tracing cloth is too thick. If a second head screen can be provided it should be covered with a thin black gauze, which reduces the light without diffusing it. This will be found very useful for reducing the light on white drapery or for casting a slight shadow on the lower part of a figure.

PRACTICUS.

A PLEA FOR THE OZOBROME PROCESS.

[The form of carbon printing represented by the Ozobrome process is unfortunately one of those methods which, though simple and expeditious in practice, assumes a forbidding complexity when described in print. A contributor, Mr. W. H. Moffitt, to the "Australasian Photo Review," has made a courageous attempt, not perhaps entirely successfully, to present the working instructions of the process in a form corresponding with the facility with which they can be carried out. Inasmuch as Ozobrome is pre-eminently a variety of carbon printing which scores particularly over its prototype during the winter months, Mr. Moffitt's notes may perhaps be read with interest by those to whom the process has hitherto been an unexplored field.—EDS. "B. J."]

It is remarkable that a process so fascinating and full of artistic possibilities as the Ozobrome Process should need any advocate; yet, so far as I am aware, there are very few people here (Australia) working at it. I hope this article will induce more to adopt the process.

Now I quite admit that Ozobrome can scarcely be called a beginner's medium: (1) In the first place, it calls for a *good* bromide (or gaslight) print, and it is astonishing what a number of photographers there are who find difficulty in producing a *really good* bromide print, and the still greater number who slur over the finishing stages, *viz.*, fixing and washing. By a *good* bromide print I mean one of a good pictorial subject, and properly

exposed, developed, fixed, hardened,* and washed. (2) In the next place, it calls for exactness, care, and thoroughness in manipulation, qualities not conspicuous in most beginners' work. (3) Lastly, it is hardly worth the time involved to make an Ozobrome of a print containing as little evidence of artistic perception and selection as the prints of the average beginner.

But Ozobrome *is not difficult* (I emphasise this), and anyone who wants to make a picture in a medium offering all the advantages of carbon—permanence, variety of colour and surface, superior gradation, richness of shadow, and control (the last-mentioned to a greater degree than carbon)—and the following important additional advantages :—

(a) Independence of light, and the consequent abolition of daylight printing, actinometer, and printing frame.

(b) Suitability of any negative that will give a good print on bromide or gaslight paper, *i.e.*, practically any printable negative.

(c) Enlarged pigment prints without enlarged negatives;

Anyone who can make a good bromide or gaslight print as above defined will find in Ozobrome not only a process that yields most beautiful results, considerably superior in many instances to the bromide prints from which they are made, but also one that from beginning to end is most fascinating in all its details. (I have often spent from 7 p.m. till midnight making Ozobromes, and scarcely noticed the flight of time.) Only simple apparatus is required; Ozobrome is not expensive.

The following are formulæ found satisfactory for the pigmenting (bleaching) and acid baths :—

A. Pigmenting and Bleaching Solution :

Potassium ferricyanide	30 grs.
Sodium (or potassium) bichromate	10 grs.
Potassium bromide	10 grs.
Water	5 ozs.

B. Acid Bath :

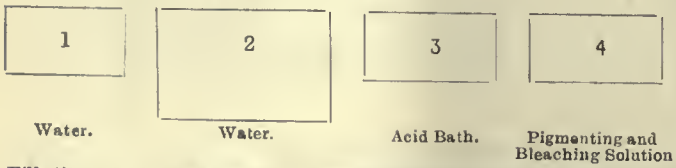
Citric acid	15 grs.
Oxalic acid	22 grs.
Chrome alum	20 grs.
Water	30 ozs.

Both formulæ can be made up to three or four times the working strength, and in larger quantities for stock solutions. Even at working strength they keep indefinitely, and the used solutions for at least a week.

The following description of the *modus operandi* will, it is hoped, give a clear idea of the process, but the reader will bear in mind that description is necessarily more cumbersome than demonstration, and will not take fright at what, admittedly *seems* somewhat complex.

There are two methods of procedure, the transfer and non-transfer; I will describe the non-transfer first.

Arrange four dishes in a row on a table—



Fill (1) and (2) with water, (3) with sufficient acid bath, (4) with sufficient pigmenting and bleaching solution. Dish (2) should be much larger than the print to be made.

Have a watch recording seconds handy. Put the dry bromide in dish (1), the carbon tissue (which for the non-transfer method should be a little *smaller* than the bromide print to prevent frilling) in dish (4). Leave the tissue till it is quite limp, then lift it by the corner and drain for about 15 to 20 seconds, *according to the result desired.* (See below.) Drain for 10 to 15 seconds, and pass into dish (2), face downwards; draw the tissue gently across the surface for about double its own length, still face downwards; lift it out and slide it again under the water *face upwards.* (Be very careful if you want uniform results to do this drawing and sliding process in the same way every time, as this regulates the quantity of solution and acid bath left in the tissue to work on the bromide print and set up the chemical action which renders the tissue more or less insoluble in proportion to the gradation of the bromide print. If too much is washed off, the bromide will not bleach thoroughly and detail will be lost, whilst the resulting pigment print will be harsh and greatly intensified, but with loss of detail in the shadows. If a surplus is left in the tissue the resulting print will be lacking in depth and the high lights will be veiled. Any intentional modification of contrast should be done by a longer or shorter immersion in the acid bath—20 seconds for normal, 10 for contrast, 30 for flatness. Very broad effects can be obtained by printing the bromide rather lightly and giving the plaster 5 to 10 seconds' immersion.)

At once lift the bromide print from dish (1) and slide it face downwards under the water in dish (2), bring into contact with the tissue, which is face up, *under the water.* Lift them out clinging together, lay on a sheet of glass, and squeegee lightly but firmly into contact. *Leave for 20 minutes to an hour.* (During this interval several other bromides can become acquainted with treated tissues in a similar manner.)

Now get a basin of hot water, as hot as can comfortably be borne. Have a kettle boiling to keep up the temperature for the succeeding prints. Put the plaster and adhering promide print into the hot water, wait a few seconds until the soluble tissue begins to ooze out at the edges, then strip off with a gentle unbroken pull the tissue backing and throw it away. Gently dash the hot water over the bromide print, which now supports the *insoluble* pigmented image (the bromide image being bleached out as in the ordinary operation preliminary to sulphide toning). The soluble pigmented gelatine soon washes away leaving the insoluble gelatine image super-imposed upon a bleached silver print. Rinse in cold water for a second or two, and hang up to dry. When dry, fix out the bleached silver image with ordinary strength hypo, wash and dry.

If desired the bleached image may be redeveloped wholly or in part with any ordinary developer, or may be sulphide toned, considerable control being possible in this way. Control is also possible while the hot water development is in progress, as in the case of ordinary carbon work, by applying hotter water locally, or by rubbing parts with the ball of the forefinger. The gelatine image is very tough as a rule, unless a longer than normal immersion in the acid bath has been given, or a surplus of acid bath remains owing to insufficient rinsing before bringing the tissue into contact with the bromide print, in either of which cases it is more readily injured. Normally it is much tougher than in the case of the ordinary carbon method, and in the shadows will stand quite a violent rubbing without injury; a little experience will soon show how much. The half-tones and high lights are more delicate owing to the thinness of the gelatine.)

The Transfer Method.

This is greatly to be preferred (unless it is desired to avail one's self of the method of control referred to above by redevelopment of the bleached image), and for these reasons :—

The resulting picture is composed of pigmental gelatine only;

Any surface may be used to support it;

The original bromide is available for further use;

It is no more troublesome, as although another squeegeeing is involved, there is no fixing and washing required. (Either method gives a non-reversed picture.)

The procedure is precisely the same as in the non-transfer method down to squeegeeing the bromide and treated tissue, but at the end of the specified time (20 minutes or upwards), put the adhering bromide and tissue into *cold* water, and separate them. This is perfectly simple, and you then hold in one hand the bleached bromide and in the other the plaster, which *looks* just the same as before contact with the bromide, but is in reality insoluble wherever the chemical action has taken place. Drop the bromide into another dish of water, and forget about it *pro tem.*

* Hardening is *necessary* for the non-transfer method, and *advisable* for the transfer method. The best acid fixing and hardening bath I have used for all purposes is from a formula I found in the original Ozobrome book of instructions. It is as follows :—

A—Hypo	1 lb.	Water	40 ozs.
B—Potassium metabisulphite	1 oz.	Water	20 ozs.
C—Chrome alum	1 oz.	Water	20 ozs.

For use, 2 parts A, 1 part B, 1 part C.

Take the plaster; as the whole substratum of gelatine is unacted upon and therefore soluble, it is clear that if the plaster were placed in hot water the substratum would dissolve and the insoluble image crumple up and float away. (It would in any case be reversed.) We must therefore get the soluble substratum uppermost before developing, and to do this we use a *transfer paper*.

This is simply good quality paper coated with insoluble gelatine. Autotype single transfer papers are ideal, and are made in all useful surfaces, but are unobtainable locally at present, largely, I am afraid, owing to the shocking neglect of carbon printing by Australian amateurs. Until it becomes available a perfect substitute can be made by fixing out and *hardening*, and washing ordinary bromide paper, using the fixing and hardening bath recommended above. Austral Pearl bromide papers are made in many fine surfaces, all quite suitable. Treat a few pieces in this way after making your next batch of bromide prints, and put them aside for subsequent use as transfer papers. (The transfer paper should be slightly *larger* than the tissue to prevent frilling.) Take the plaster then and bring into contact under the cold water with a piece of transfer paper, as soon as the transfer paper has become limp. Lift out and squeegee firmly into contact, using moderate pressure. (I much prefer a roller squeegee for this business, but am quite aware that in this preference I am unorthodox. Quite a small squeegee will do for the largest work, about 5 ins.) Place the adhering papers between blotting sheets under a moderate weight for 10 minutes to an hour. (During this interval you can separate several other bromides and plasters, and squeegee the plasters to the transfer papers, placing them under the same weight one on top of the other, separated only by blotting sheets.)

Now place plaster (or tissue—I have used the words synonymously throughout) in hot water, and proceed as in the non-transfer method, viz., strip the plaster backing and develop, rinse and hang up to dry. *When dry the print is finished.*

You may now turn to the bleached bromides: rinse and redevelop them in amidol (preferably) or any other non-staining developer, wash for a few minutes, dry, and they will be ready for producing a further batch of Ozobromes.

If this description of the procedure be thoroughly grasped it will be realised that there is nothing from beginning to end calling for special skill. To assist the reader to obtain a clear mental view of the process, the following outline of the different stages may be of use:—

Outline of the Non-transfer Method.

1. *Materials.*—Bromide print, piece of tissue (slightly smaller), four dishes (one very large), squeegee, pieces of blotting paper, two pieces of plate-glass (one for squeegeeing upon, the other to act as a weight), pigmenting solution and acid bath, and hot water. (The water can be heated while the print and plaster are in contact.)
2. Pour cold water into two dishes (including the large one), acid bath in another, and pigmenting solution in the fourth.
3. Immerse bromide in water; plaster in pigmenting bath till limp; drain 15 seconds, immerse in acid bath 10 to 30 seconds, drain 15 seconds; bring into contact with bromide under water (taking care to follow specified procedure), squeegee into contact (all this can be done in four or five minutes easily); leave for 20 minutes to an hour, and treat some more prints and plasters in the interval.
4. Separate in hot water, develop, rinse, and dry.
5. Fix and wash (a week after if you like).

Outline of Transfer Method.

1. Materials as under (1) above (but tissue slightly larger than print), and transfer paper (slightly larger than the tissue), and developer for bleached bromides (which need not be made up till all other operations are completed).
2. As under (2) above.
3. As under (3) above.
4. Separate in *cold* water, squeegee tissue on to transfer paper; leave 10 minutes to one hour; separate and squeegee some more papers in the interval.
5. Develop in hot water, rinse, and dry.
6. Develop bromide prints.

Some Concluding Notes.

Six to more Ozobromes by the transfer method, nine to a dozen by the non-transfer method, represent a fair evening's work—say three hours. And they will seem little longer than three minutes, so engrossing and fascinating is the process.

Frilling is almost always due to using plaster or transfer paper respectively smaller than print and plaster in the transfer method; and to using a plaster larger than the bromide in the non-transfer. Blisters are rare—they may be caused by splashing very hot water from a height during development, or by leaving the plaster for an excessive time in the acid bath.

A correspondent of the "Amateur Photographer and Photography" says: "After amusing myself with photography for the last sixty years, I have taken up carbon work, with which I have been very successful. *I wish I had tried it before.*" Reader, don't you wait sixty years—take it up now in the form of Ozobrome, and see if you don't thank me for the advice when you have acquired facility in the working of the process: three or four evenings should ensure this.

W. H. Moffitt.

PHOTOGRAPHIC MEASUREMENT OF THE INTENSITY OF SPECTRUM LINES.

In the course of a lecture at the Royal Institution on "Energy Distribution in Spectra," Professor J. W. Nicholson, F.R.S., described a method worked out by Dr. Merton and himself for the measurement of the intensity of spectrum lines on a comparative photographic basis by which inequalities of plate-sensitiveness in different parts of the spectrum are eliminated. While it is not possible to follow Professor Nicholson precisely in his reference to the want of relationship between the density of a photographic image and the time and intensity of light producing it, his description of the method deserves to be quoted from "Nature" of August 21 last, where the lecture is printed at length, and to which the reader must be referred for an account of the investigations and conclusions followed from data obtained in this way.

Professor Nicholson writes:—The intensities of spectrum lines have usually been recorded on an arbitrary scale, ranging between 10 and zero, the numbers assigned being at the discretion of the observer, and varying so greatly among different observers as frequently to be of little value for exact knowledge. They depend also very much on the nature of the observation, whether visual or photographic, and in the latter case on the region of the spectrum to which the line belongs. The sensitivity of a photographic plate varies with the wave-length of the light in a curious manner, and apparently an irregular one not following any simple law. The sensitivity of the eye is also different for different colours. When the line is outside the visible spectrum, in the infra-red or dark heat region, measurements of intensity can be made with some accuracy by a thermopile or a bolometer. But they are needed more urgently in the visible region at present, not only for the information they will afford regarding the nature of the atom, but also for application to other problems. The subject is very important, for instance, in the interpretation of celestial spectra, and more particularly those spectra of great complexity and variability which are associated with the birth of new stars, from which most of our knowledge regarding such stars must be constructed.

Previous knowledge of changes in spectral intensity under varying conditions was of necessity limited to the great changes. Those changes, which are of especial value in connections such as I have mentioned, are liable to be of a less conspicuous type, not readily capable of detection by the ordinary photographic or the visual method, and, if detected, not capable of accurate measurement.

In adopting any photographic method for quantitative work we must remember that not only does the sensitivity of the plate vary with the wave-length, but also that there is no very definite relation between the density of a photographic image and either the intensity of the light or the time of exposure. If we halve the former and double the latter, we do not get the same density of the image, but another which depends on the particular plate used. The grain of a plate also scatters light, and the actual size of the

image thus depends on the exposure and the intensity of the light. We were early compelled to conclude that accurate measurements of intensity by a photographic method involve the necessity of an equal exposure on the same plate for all the sources of light to be compared, and the method to be described satisfies this necessity.

The spectrograph for producing and photographing the lines of a spectrum is set up in the usual way, which requires no description. A wedge of neutral-tinted glass, cemented to another of clear glass so as to form a plane parallel plate, is mounted in front of the slit. The image of the slit formed by light of any wave-length is thus attenuated towards the part of the slit opposite the thick end of the wedge, where the absorption of light is greatest, and the image ceases to be strong enough to affect the plate beyond a certain specific height, which depends on the original intensity, in the beam from the source, of this particular wave-length.

The photograph thus consists not of the usual spectrum with all lines or slit-images of the same length, but of a spectrum in which all the lines are cut down to specific heights depending on the original intensities, and thus it gives a simultaneous record of all the intensities in the spectrum at any one instant. All spectrum lines have a breadth, due to the Doppler effect of the atomic motions in the kinetic theory, and to other agencies. The shape of one of the truncated lines depends on the original law of intensity across the line, and they may be wedge-shaped, or bounded by a more or less rounded curve, from the nature of which, if the boundary can be sharply defined, we can deduce mathematically the law of intensity across the original line. Sharp changes of intensity, such as occur when the line has several close components overlapping one another, are detected as peaks or kinks in this bounding curve. The original photograph can be enlarged with considerable magnifying power, and if the bounding curve on this enlargement is sharply defined, we can obtain its mathematical shape very accurately, and deduce an estimate of the intensity in any part of the line with a great degree of precision. We have been able to show that in most of our experiments such accuracy as 1 part in 100 has been reached, and it could readily be increased, if desired, by the use of greater magnification of the original photograph.

The determination of the exact boundary of a patch of dark on a white ground is a matter in which "personal equation" is important. We overcame this difficulty by enlarging positives, prepared from the negatives, on to bromide paper through a ruled "process" screen. The resulting photograph consists in this way of an assemblage of very minute dots, fading away towards the boundary into invisibility. It is a simple matter to prick out the last dots visible all round the contour, and in this way personal equation can apparently be entirely eliminated. We adopted usually about 100 dots to the inch on the final photograph. If comparisons of different lines with one another are required, only the central heights of the figures are necessary, and the topmost dot can be seen at once.

PARA-AMINO-CARVACROL—A NEW DEVELOPER.

[A communication from the Colour Laboratory of the United States Bureau of Chemistry describes the preparation of a new photographic developer having a constitution indicated by the above name. The new developer is a derivative of cymene, and its preparation has been worked out in view of the possibility of abundant sources of carvacrol prepared from cymene. We are indebted to the United States Bureau of Chemistry for this communication, which had previously been published in the "Journal of Industrial and Engineering Chemistry," May, 1919.—Eds. "B.J."]

For some time this laboratory has been engaged in a study of cymene and its derivatives[1], with the idea not only of preparing new derivatives of cymene, but also improving the methods of preparation of those already known and the development of their possible commercial application.

Two of the more extensively used photographic developers are *p*-aminophenol and quinol (hydroquinone). Similar substances can be prepared from cymene, and are described in the literature, but their commercial applications in photography have apparently not been investigated. Both *p*-amino-carvacrol and thymoquinol can be obtained from carvacrol. The preparation of *p*-amino-carvacrol is relatively simple, and a fairly good yield is secured.

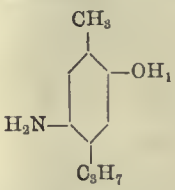
The patent recently granted to McKee[2] on the preparation of carvacrol from cymene seems to make possible the development of an abundant source of supply of this phenol, which hitherto was prepared only in small amounts.

The process of McKee[3] involves the sulphonation of cymene and a subsequent alkaline fusion of the sulphonic acid. The preparation of a phenol on a small laboratory scale by such a method is usually not very satisfactory because of the poor yield from the alkaline fusion. The writer has found that a yield of 85 to 90 per cent. of carvacrol can be obtained by diazotising aminocymene, dropping the cold diazo solution into dilute sulphuric acid and simultaneously steam-distilling. This is a very satisfactory laboratory method for the preparation of carvacrol. The 2-aminocymene can be obtained in good yields by a method described in the first paper on *p*-cymene.

p-AMINOCARVACROL.

Tests of this compound showed it to be a very promising photographic developer.[4] Comparisons of monomethyl *p*-aminophenol (commercially known as metol), *p*-aminophenol, and *p*-aminocresol with *p*-aminocarvacrol were so favourable to the last-named as to warrant a detailed investigation of its properties. The preliminary results indicate that *p*-aminocarvacrol is more satisfactory than *p*-aminophenol, but not quite so good as *p*-aminocresol or "metol," so far as lasting quality of the bath is concerned, but equally good with respect to quality of tones secured in the finished prints.

METHOD OF PREPARATION—*p*-AMINOCARVACROL,



was prepared by reducing *p*-nitrosocarvacrol by means of ammonium sulphide. For the laboratory preparation of *p*-nitrosocarvacrol the method of Klages[5] is quite satisfactory. The following description is essentially the procedure of Klages, with slight modifications.

Ten grams of carvacrol are dissolved in 40 g. of alcohol, saturated with hydrochloric acid gas at 0°. To the cooled solution add an aqueous solution of 5 g. of sodium nitrite in 10 cc. of water. Before addition, the nitrite solution is diluted with an equal volume of alcohol. In a few minutes the solution becomes a pasty mass. This is diluted with water, filtered and washed. The crude nitrosocarvacrol thus obtained is not further purified but used in this form.

Reduction.—The crude nitrosocarvacrol is dissolved in about 10 times its weight of 10 per cent. ammonia and filtered from the tar. A rapid stream of hydrogen sulphide is passed into the ammoniacal solution and the aminocarvacrol is precipitated as practically colourless leaves. The solution is then cooled and filtered, the precipitate dried with suction, washed with cold water, and dried in a vacuum desiccator over sulphuric acid. In case it is necessary, the aminocarvacrol can be recrystallised by boiling with hot water to which animal charcoal has been added, filtering and cooling the solution.

To prepare the hydrochloride, which is much more soluble in water than the free base, the aminocarvacrol is suspended in a small amount of water and about the theoretical amount of hydrochloric acid added. The solution is heated and filtered while hot.

(1) "Para Cymene. I—Nitration, Mononitrocymene," "Journal of Industrial and Engineering Chemistry," 10 (1918), 453.

(2) U.S. Patent 1,265,800, May 14, 1918.

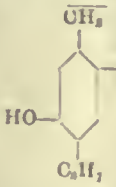
(3) "Journal of Industrial and Engineering Chemistry," 10 (1918), 982.

(4) Tests were made by H. A. Piper, of the Science and Research Department Bureau of Aircraft Production, since the photographic research of that organisation was handled in this laboratory.

(5) "Biechter," 32 (1889), 1518.

To the hot solution concentrated hydrochloric acid is added until a precipitate begins to form. When the crystallisation is completed by cooling the solution, the hydrochloride is removed by filtration and dried *in vacuo* at 75°.

From 10 g. of carvacrol about 5 g. of aminocarvacrol in quite a pure condition were usually obtained.

Thymoquinol, 

was prepared by sulphonating carvacrol and oxidising the sulphonic acid by means of potassium bichromate. The quinone thus produced was reduced by means of sulphur dioxide. The yields were very poor, and since this compound, from preliminary determination, shows no advantage over ordinary quinol, work along this line was not further prosecuted.

p-Aminothymol was also prepared, but this base did not seem to be so satisfactory a developer as the corresponding carvacrol derivative One disadvntage is the relatively low solubility of the free base in water.

SUMMARY.

p-Aminocarvacrol is a very satisfactory photographic developer, and its preparation and use for such a purpose would furnish a means of using a portion of the large amount of *p*-cymene which is not being utilised at present.

HERBERT A. LUAS.

Exhibitions.

PHOTOGRAPHS BY MR. WARD MUIR.

THE exhibition of "straight" photographs by Mr. Ward Muir which is being held at the London Camera Club during the present month is, so to say, a kind of mission, though Mr. Ward Muir suggests rather than defines his point of view. His text, according to the catalogue, is "Photography deals with facts. Point your camera at a beautiful fact and you get a beautiful photograph." In supplement to this dictum it is stated that the photographs are all direct prints or enlargements from unretouched negatives. The seventy exhibits show a variety of treatment and effect which will certainly be welcomed by those, like ourselves, who have long contended that photography loses much of its intrinsic quality as an artistic medium when it allies itself with non-photographic methods. Nevertheless, we cannot help feeling that without going to the extremes which have been adopted by many pictorial workers, a capable critic and self-critic as Mr. Ward Muir is would have produced from these same negatives an exhibition which artistically would have been more satisfying had he not elected to follow rigidly the path of "straight photography." In eschewing "control" of any kind whatever we think Mr. Ward Muir has only shown that he has lost something by doing so. While using such means as may reasonably be said to be photographically legitimate, he would have expressed his text in his photographs no less forcibly, for as we interpret the dictum which we have quoted he is seeking to get photographers to realise that if they can see a beautiful fact, more than half the battle in the making of a photograph with some claim to artistic quality has been won. Not all of it, however, as we think; and the exhibition is also incidentally a demonstration of that. But whatever one may think of these considerations the collection is one which is bound to be of the very greatest interest to the amateur photographer who must surely envy Mr. Ward Muir both his gift of perceiving lines and pattern in landscape, and even in the surroundings of manufactories, and his accomplished technique in rendering delicate effects of tone and lighting. The exhibition is open daily except Sundays from 10 a.m. to 5 p.m. at the Camera Club, 17, John Street, Adelphi, London, W.C.

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Applications, August 17 to 30.

SELF PORTRAITURE.—No. 20,340. Self-photographic attachment for hand cameras. E. J. Davis and S. Dronsfield.

FILM SPOOLS.—No. 20,519. Photographic roll-film spools. M. Niell.

CINEMATOGRAPHY.—No. 20,640. Cinematograph apparatus. H. H. and S. H. Moon.

ARC LAMPS.—No. 21,037. Arc lamps for photography. B. J. Hall.

CINEMATOGRAPHY.—Nos. 20,997 and 21,396. Cinematograph apparatus. Barr and Stroud and J. W. French.

CINEMATOGRAPHY.—No. 20,998. Operating film in cinematograph apparatus. Barr and Stroud and J. W. French.

CINEMATOGRAPHY.—No. 20,899. Apparatus for photographing or projecting moving pictures. C. and H. C. Beck.

CINEMATOGRAPHY.—No. 21,133. Cinematographs. H. Grimshaw.

COMPLETE SPECIFICATIONS ACCEPTED.

These specifications are obtainable, price 6d. each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

AERIAL STEREOSCOPIC PHOTOGRAPHY.—No. 128,022 (June 26, 1918). According to the invention, the camera is provided with a blind corresponding to that of the ordinary focal plane shutter, but having in place of the usual slit or aperture which extends right across the plate two slits, one extending from near the edge of the plate to a point approximately at the centre thereof, and the other of a similar length but extending from the centre to near the other edge of the plate. These two slits are separated from each other by a length of the blind sufficient, according to the speed of the spring roller which causes the travel of the blind, to provide the necessary time interval between the one exposure and the other.

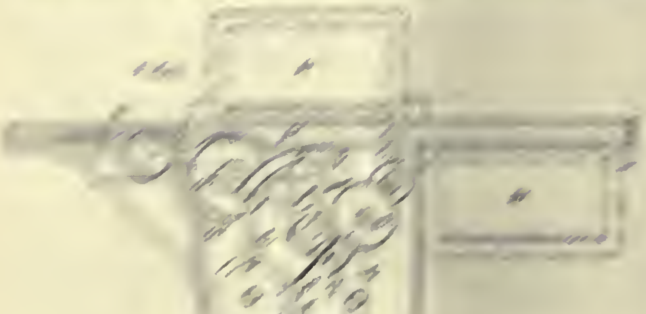
If necessary, any suitable stop mechanism may be provided to cause the blind to pause in its travel relatively to the plate between the exposure caused by one slit and that brought about by the other.

Any well-known mechanism may be used for determining and regulating the time interval between the exposures, and such mechanism may be made dependent upon the speed of the aeroplane if desired.

In some cases it may be possible to make the interval between the two exposures depend simply upon the length of the blind separating the two slits, but usually it is more convenient to employ some form of pause or stop mechanism in connection with the blind roller.—Douglas Arthur English, Captain, Royal Air Force, Instructional Officer, School of Photography, South Farnborough, Hampshire.

CAMERAS WITH MECHANICAL PLATE-CHANGING.—No. 128,662 (August 29, 1917).—The invention relates to magazine plate-holding and plate-changing apparatus having magazines for the unexposed plates and for the exposed plates, and a sliding frame by which the plates are transferred from one magazine to the other, as described in Patent 11,651, 1915. A clock-work, spring, or other motor is provided so that, on release of the shutter, or on starting the motor, exposure is effected, the plate is transferred, and the shutter is re-set.

As shown in fig. 1, a spring motor, B, is connected through a train of wheels with a wheel, *b*, which is linked to and rocks a quadrant, D, engaging a compound pinion, a^1, a^2, in gear with a



showing the colour. The composition prepared to shield above can be used in the usual manner. Felix David, 32, Rue de Lorem, Paris.

Trade Names and Marks.

MARKS PLACED ON THE REGISTER

The following marks have been placed on the register:—

Manchester.—No. 508,270. Photographic chemicals. Johnson and Sons, Manufacturing Chemists, Limited, 52, Cross Street, Finsbury, London, E.C., manufacturing chemists.

APPLICATIONS FOR REGISTRATION

Glasgow.—No. 480,175. Chemical substitution used in manufacture, photographic, etc. The British Drug Houses, Ltd., 22-32, Graham Street, London, N.1, wholesale druggists.

CATALOGUES AND TRADE NOTICES.

Kite's Home Lamps.—A 24-page booklet, just issued by Messrs. Kite's Ltd., Central Works, Clapham Common, London, S.W.4, describes in an interesting way the added features of these good lamps, namely, the Upton, Combinable, and Universal, and is moreover a priceless of these improvements. The booklet, which is sent free on application, contains a large number of reproductions of photographs taken with the lamps.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK

Saturday, September 27.

Middlesbrough Naturalists and Photographic Section. Excursion to Wheldrake.

Chelsea Photographic Society. Outing to Windsor Park.

In Thomson Dean Photographic and Scientific Society. Outing to The Seven Sisters.

Monday, September 29.

Hackney Photographic Society. "Pictures." F. Nicholls.

Wednesday, September 30.

Acton Middlesex Photographic Society. "Hints on Lantern." W. H. A. Fowler.

Thursday, October 2.

Photographic Illustration Group Photographic Society. "Photographs of the Year." F. J. Mortimer.

FORTHCOMING EXHIBITIONS.

September 13 to October 11.—London Salon of Photography. Hon. sec., 56, Pall Mall East, London, W.C.1.

October 13 to November 26.—Royal Photographic Society.—Entries close September 19 (morning), September 20 (hand). Secretary, J. Mitchell, 35, Russell Square, W.C.1.

News and Notes.

Will Mr. Hunt, late of Dresden House, kindly address the Editors, who have a communication for him.

Mr. A. Corrian, formerly manager of the professional department of Messrs. Kodak, Ltd., has joined the staff of Messrs. Houghtons, Ltd., and will represent their professional department in the Midlands, South Wales, and West of England.

1,000 Travelling Dark-Rooms, according to a recent report in the "Times," are among the surplus R.A.F. material which has accumulated at the R.A.F. storage depot at Feltham, Middlesex. According to the "Times" reporter, the cameras are still fully equipped, and are "waiting," through standing in the open without shelter.

A War Memorial to the boys of Tyrrell Street, who have served in the war, and more especially those who have fallen, has been erected by Mr. George Miles, photographer, of Tyrrell, in the shape of a camera, constructed in a massive gilded frame, and bearing the photographs of the youngsters Tyrrell boys whose lives have been lost.

Boots Photographers.—Before Stockport magistrates on Monday four photographers were each fined 40s. for taking photographs on the boundary. The Chief Constable said while some bathers might not object to being photographed coming out of the water, a great number did. Photographers made as much as £5 a day on this work, and the penalty imposed on the Court was regarded as a mere joke. The Mayor stated that the practice would have to cease, and the Corporation would have to see if they could not get the maximum penalty imposed.

Film Sir Prizes.—The competition work of Sir Arthur Pearson for soldiers, blinded in the war in the subject of an appeal to the generosity of the public, which has been designed to take the operatives form of a prize of three guineas, "Joy Bells of Peace Value," by Fernand Nicol, which can be supplied to traders for distribution in place of the customary alternate, or may be offered for sale to the public. The publication further carries with it an illustrated article telling of the trades which blinded soldiers have learnt, and thus every copy which is circulated is a help to the committee in their programme of assisting men to support themselves by the trades they have learnt. Full particulars of the scheme may be obtained from the Organising Secretary, Mr. John Pulham, 36, Regent Street, London, W.1.

Colour Photography and Cinematography.—A Central News message from Christiania last week states that Professor Gerdes, the well known Russian scientist, who has been resident in Norway for some years, has made what experts describe as a sensational discovery in regard to the reproduction of natural colours by photography. The patent has already been sold to a syndicate, which has formed a company with a capital of eleven million kronen to develop it. General Robeson has been appointed chairman of the directors.

Arising out of this news from the "Daily News" has received the following letter from Mr. Finnigan, partner of Mr. R. A. Hodgson:—

"On January 1, 1919, my partner, Mr. R. A. Hodgson, of Brighton, and I lodged a provisional patent which was accepted on February 18, 1919, and is numbered 29,174, and which is a patent for a method of taking and printing photographs in natural life and for cinematograph films in natural colours without the use of coloured screens, and by means of an ordinary camera.

"Immediately the patent is sealed, business negotiations will be commenced on a large scale, although the finance now being arranged looks like having to come from the Continent, owing to the fact that British financiers persist in fostering their trade to the disadvantage of the inventor, whilst the Continental financier is always willing to acknowledge the inventor handsomely."

In the course of an interview Mr. Finnigan explained to a "Daily News" representative that when operations begin coloured cinema films will be able to be produced by this method at a cost of only threepence per 1,000 feet above the cost of ordinary film, while for the dozen cabinet plates in colour the extra cost will only be 1-10 of a penny.

"We claim to have got the only perfect yellow," said Mr. Finnigan, "and if we can persuade the British manufacturers to produce some positive film and some reasonable film, we can have a real British industry. Another great advantage of our method is that colour photographs can be taken with an ordinary box camera."

Mr. Finnigan also states that in July of this year experts declared that his was the only known method of producing positive pictures in natural colours on to photographic paper or film from a negative.

Correspondence.

Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

We do not undertake responsibility for the opinions expressed by our correspondents.

LIGHT FOR RETOUCHING.

To the Editors.

Gentlemen,—The arrangement for modifying the light for retouching, explained in the "B.J." of August 29, seems very elaborate, and rather unnecessary. In the days when I did a good deal of retouching I found it best to avoid any arrangement which allowed any light, however diffused, to fall directly on the negative, as it was always very trying to the eyes, and I maintain that retouching ought not to produce eye-strain if the negative is properly illuminated. I have often retouched till long past midnight without getting my eyes tired. The arrangement I have always used, whether the source of light was paraffin lamp, incandescent gas, electric or daylight, allowed no light to fall directly on the negative, but was all sent upward through the negative by reflection from a sheet of white paper, or if the negative was extremely dense a piece of matt sheet aluminium was used instead.

Eye-strain in retouching is caused by trying to see every stroke made by the pencil. I believe it may be almost entirely avoided by working at such a distance that each touch is not seen but only the general effect, working just as an artist does when he "stipples" in water-colour or miniature painting.

Many retouching desks are not sufficiently upright; the slope of the desk should not be less than 60 degs. This will be found more restful and healthy, and will not cause the worker to stoop. This was the angle of the desks used by the mediæval writers, who spent their lives writing at a time when writing was a fine art. I often wonder that men who spend their days "pen pushing" do not use a desk with a steep slope; they would get far less indigestion and have straighter backs.—Yours faithfully,

RETOUCHER.

EYE-GLASS FOCUSSING MAGNIFIERS.

To the Editors.

Gentlemen,—Some time ago in "Ex Cathedra" some hints were given about a magnifying glass for focussing, and it was suggested that it should be attached to the camera. It reminds me of a friend of mine, a process-worker, who always had his magnifier tied to his working coat with a piece of string; but that arrangement would scarcely suit the portrait operator, whose appearance should be fairly respectable. A far better arrangement than the usual eye-piece, which can be used with only one eye, and also needs a hand to hold it, is a pair of eye-glasses fitted with magnifying lenses to fit the wearer's sight; they will be found extremely useful for many purposes. But only the lower half should magnify; the upper half of the rims should be filled with lenses to suit the wearer's ordinary sight, so that he may see the sitter or object to be photographed through the upper half of the frame, and look through the lower half at the image on the focussing screen. The arrangement is known as a Franklin lens, and can be supplied by most opticians, and the people who need a magnifier for focussing usually need spectacles or eye-glasses for reading, and will find no difficulty in using a pair of extra strong ones for focussing, and they will be found far better for the work than a single glass, which has to be held in the hand and moved here and there over the focussing screen. Of course, such glasses should be worn only when focussing or examining any object where a magnifier is necessary. They should, of course, be carried in the pocket when not in use, and not left lying about.

It is best to get the optician who supplies these very strong glasses to test each eye separately, as probably no living person possesses a pair of eyes of equal focus, like a stereoscope.

The optician must be shown how much magnification is necessary, as, of course, the amount varies with every individual, and it will be found that every year or two more powerful lenses become necessary. But some people are so vain of their youthful looks that they will go on straining their eyes for years rather than admit that they need "glasses." Nothing could be greater folly for a photographer, whose living depends largely on his eye-sight.

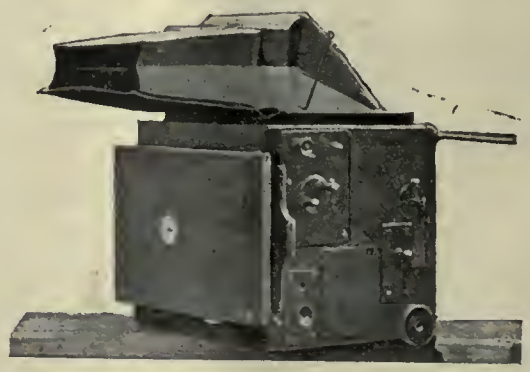
These Franklin lenses are very useful for ordinary purposes, and will save carrying two pairs of spectacles and having to change from one to the other when a different focus is wanted.—Yours faithfully,

BI-FOCAL.

THE EYE-LEVEL REFLEX.

To the Editors.

Gentlemen,—Poor much-criticised reflex, most beloved of my possessions, why must you always be condemned for waist-level use? Never since purchasing have I used you at waist level. At scale focussing I am lost, being poor at judging distance, but that is one of the things which never trouble me now I can always use my reflex at any time. The enclosed photograph shows the machine open ready for use. I always focus up to the moment of exposure; then, looking down into the mirror with an half-glance along the top of the camera at my subject, I firmly press the hood against my forehead, pressing my elbows firmly into my sides, making my exposure. No use for *Yankee periscope* here; this can always be used at eye level. I am much surprised some enterprising firm does not make a reflex on these lines. I do not say mine is an original idea, but I have never seen another one in use. I purchased an ordinary Planex



reflex, took off the look-down hood, which was utterly useless for my work, and fixed the adapter containing a mirror at an angle to the focussing screen, and it has added pounds in value to my machine. Furthermore, the reflex can be used much steadier in the position I have adopted than at waist level. I have exposed at 1/4 sec. and enlarged from the same without showing the least movement. Of course, the object is reversed in the mirror (that is, upside down), but to a camera man that does not make the slightest difference. Don't wait for the Yankee dodges, which only add weight to what is already condemned for bulk. The adapter here shown, when not in use, folds perfectly flat, and lies flat on the top of the machine, ta[illegible] no more room than the ordinary folding hood.

The above article may prove of interest to many of your readers (along with the photograph). It is the machine I have in use, has been given a severe test under all conditions, and has never failed me yet. The idea is quite practical and well worth adopting. I do not like the reflex-condemning when I know the waist-level idea is all a fallacy.—Yours sincerely,

A. PALFREYMAN.

3, Chapel Lane, Attercliffe, Sheffield, Sept. 1, 1919.

THE BELITSKI REDUCER FOR NEGATIVES AND BROMIDES.

To the Editors.

Gentlemen,—The articles by "Practicus" are always good and helpful, and as a rule I agree with what he says, but for once I find my experience is quite contrary to his. In recommending Farmer's reducer he tells us if we want to clear up the shadows of a negative to use the reducer so strong that it acts very quickly and reduces the shadows before it touches the denser parts; and by using it very dilute it will reduce the high-lights before the shadows are touched by it.

My experience is exactly contrary, and when I wished to reduce a hard negative I used it so strong that it acted very rapidly, so rapidly in fact that the dish had to be violently rocked to ensure even action over the whole of the plate, and I always kept one finger under a corner of the negative so that I could snatch it out of the reducer and hold it under a strong flow of water from the tap, which was kept running during the whole time, so that not a second should be lost in turning on the water. The whole time of reduction would not exceed ten seconds on many occasions. But if I wished to reduce the shadows without affecting the high-lights I used it so dilute that the operation would take ten minutes or longer. I have quite given up using this reducer, except when I wish to make a negative more brilliant to put a little sparkle into a lantern slide which is muddy.

For the last year or two I have used another reducer for softening contrast; it is known as Belitski's. It works very evenly, attacking the dense parts first, or it appears to do so, and only reducing the shadows when a great amount of reduction is attempted. It is the best reducer of bromide prints I have ever used. It will keep in good condition for months in the dark room, and is always ready for use, and may be used repeatedly till exhausted.

It is made by dissolving potassium ferric oxalate 22 grs., and sodium sulphite 18 grs., in water 1 oz. When dissolved a blood-red solution is formed. To this are added a few crystals of oxalic acid. As soon as the red solution turns green it is poured off the crystals, which may be thrown away. Finally, hypo, 120 grs. in ½ oz. of water, is added, and the reducer is ready for use. Negatives may be put into it as soon as they are fixed, unless they have been developed with pyro, and the fixing-bath discoloured with pyro. In such cases it is advisable to wash the negative before reducing, to avoid an ink-coloured stain formed by pyro still remaining in the film and the iron salt in the reducer. As a matter of fact, ink is really made by mixing gallic and iron compounds. As the solution keeps indefinitely in the dark-room, it is convenient to make up fifty or more ounces at a time, and it is then always ready to reduce either negatives or prints. I have not tried it for print-out silver papers, but I should think it would work equally well with them. It is convenient to make up this reducer with a smaller proportion of water when making a stock solution, as it works rather slowly for negatives if used at the strength given above, but it should be diluted considerably for bromide prints. It will not reduce toned bromides. The only solution that will do this that I know of is the iodine-cyanide given by "Practicus," which, however, I make up in a simpler way by adding a few drops of strong tincture of iodine (which can be obtained at any chemist's) to a solution of potassium cyanide.

Ammonium persulphate has never been a favourite of mine, as it has always been so erratic in my hands, and has more than once ruined a negative, and the Belitski reducer has proved a good substitute. This latter is most useful when making a series of negatives on panchromatic plates, for instance, when it seems almost impossible to secure even density, in spite of all precautions in using exposure meters, standard developers, and timing development; the density of the negatives will persist in coming of different densities. It is then that this reducer is so useful, because the denser ones can be brought down gradually to the proper density without upsetting the proper gradation. I think that professional photographers would find it a most useful addition to the dark-room solutions.—Yours faithfully, HAROLD BAKER.

Birmingham, September 3.

Answers to Correspondents.

SPECIAL NOTICE.

In consequence of general reduced supplies of paper, as the result of prohibition of the importation of much wood pulp and grass, a smaller space will be available until further notice for replies to correspondents.

Moreover, we will answer by post if stamped and addressed envelope is enclosed for reply: 5-cent. International Coupon, from readers abroad.

The full questions and answers will be printed only in the case of inquiries of general interest.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

F. R. I.—You can get a new blind fitted to the Goerz Anschutz camera by Mr. R. E. Peeling, 4/6, Holborn Circus, London, E.C.4.

R. M.—Formaline is a 40 per cent. solution of formaldehyde in water. As regards formulæ for hardening-fixing baths containing formaline, the best reply we can make to you is to refer you to a paper on this subject in the "B.J." of November 2, 1917, which probably our publishers can still supply, price 4½d.

N. E. M.—A little book which our publishers issue, "Commercial Photography," price 1s. 2d. post free, is actually the only manual which deals with such work as an engineering photographer is called upon to do. No doubt the hints in it would be of service to you.

S. A.—We do not think the two postcards are photographs, in all probability they are lithographs, for when examined under a magnifier the image shows a characteristic lithographic grain. Photographically it would be difficult to match them except very crudely, but you can easily see how near you can get to them by using the Bertha stains of the Vanguard Manufacturing Company, Maidenhead, which are prepared and sold for obtaining this kind of effect.

A. F. C.—So far as we understand your letter, any agreement which you have made with your landlord is not upset in any way by your position under the Retail Businesses (Licensing) Order. If you have made an agreement for the lease of premises and you subsequently find that you cannot get a licence to carry on the business we think there is no doubt whatever that the agreement with your landlord still holds good. We imagine this is what you are asking us.

A. M.—For copying outdoors the best arrangement you can have is a kind of funnel-shaped tent made of muslin and open at each end One end is pushed up right against the easel, whilst the camera is pointed into the other end. By this arrangement you get a very efficient diffused light which will show the minimum of grain in an original. You can easily adjust it to changes such as the sun coming out by having one or two thicknesses of muslin laid on the tent. "Commercial Photography," issued by our publishers, describes this arrangement further.

4 E.—In enlarging from 12 x 10 negatives you require a lens which will cover a 12 x 10 plate, which means a 14 in. lens of, say, f/6.8 aperture, or, say, a 10 in. lens if of the wide-angle type and of f/16 aperture. The latter may make enlarging unduly slow if you are working by artificial light, and also even by daylight in the case of dense negatives or poor daylight. On the other hand, the 14 in. lens necessarily calls for more space between the lens and the enlarging easel if you are making enlargements on any considerable scale. Of the two, however, we should say that a 14 in. lens of about f/6.8 is by far the better choice.

E. V.—We suppose it is a condenser enlarger, in which case the best electric light is a small arc lamp such as is supplied by the Westminster Engineering Co., Victoria Road, Willesdon, N.W. The alternative is a half-watt lamp of the focus type, that is with the filament brought to a small cluster. We are by no means sure that these are now obtainable again. You should apply to the General Electric Co., Ltd., 67, Queen Victoria Street, London, E.C. If you have dense negatives to deal with at times, especially on a great scale of enlargement, you had far better choose the arc. With a focus lamp you are pretty certain to require to diffuse the light with a ground-glass screen placed as near to the lamp as can be done. Even though this may be necessary with an arc lamp, the much greater actinic intensity of the latter allows of exposures still being conveniently short under unfavourable conditions.

S. T.—If your sulphide bath was in good condition there is nothing in the formula to account for the bad tones. It would be worth while to make up fresh sulphide stock if further prints are defective in this respect. Apart from this, one of the most common causes of weak prints and bad colour is too rapid (that is, too superficial) development of the black print. It is a necessary rule for the best sepia results, as regards colour and depth, to expose the bromide paper only for such time that it can be developed for three or, better, four minutes without becoming too dark. In this way you get a more solid deposit in the black prints with corresponding benefit to the sepia tone.

F. M.—1. Under the Retail Businesses (Licensing) Order you requite to obtain a licence to open a new studio. The office to which you should apply is 5a, Union Street, Bristol. If you do not trade in your own name, you also require to register under the Business Names Act. For this you should apply for a form to the Registrar of Business Names, 39, Russell Square, London, W.C. 2. Prints mounted with the gelatine mountant, formula for which is given in the "Almanac," should not suffer from impermanence in any way. We used these mountants years ago, and have never noticed any results of fading, and are quite sure that, at any rate, development prints would show none from this cause. For prints of more delicate image, such as P.O.P. there is no mountant, so far as permanence is concerned, to equal that made with starch.

H. C.—With an $f/4.5$ or even $f/6$ lens and a focal-plane shutter which will give such slower speeds as 1/25th or 1/50th of a second under-exposure ought not to be an inseparable feature. However, if plates are regularly under-exposed, we are afraid there is no really satisfactory remedy for it by development. Personally we should use pyro-metol for such cases, although, unless you are ready to use it fairly weak and are careful not to over-develop, you can easily get negatives which are hopelessly hard. Certainly you can use the developer warmer, up to 70 or perhaps 80 degs., if the plate will stand it. On these lines you might find the hardening solution sold as the "Tropical" by Messrs. Johnson and Sons, 23, Cross Street, Finsbury, London, E.C., of service to you, but you are always on the limit of fogging the plate in warming the developer up. Without knowing what subjects you have in mind, we think that you must be giving unnecessarily short exposures.

D. K.—Twelve feet square is a very small room even for ordinary portraiture, that is of single figures, and almost impossible for groups even of two or three people. You are already finding that out in using your present lens, which, probably, if sold with a half-plate camera, is about 8 or 9 ins. focal length. In order to get in a full-length figure on the half-plate you would want a lens of only about 6-in. focus, which, to cover a half-plate, would have to be one of the slow wide-angle type. Therefore you are between the devil and the deep sea. You must either get more space or be content with either part of the figure on the plate or the use of a wide-angle lens. Without knowing more of your circumstances, we should say your best course would be to confine yourself to three-quarter length figures or head-and-shoulder portraits, in making which you will probably find that the focal length of your lens is about right for the dimensions of the room, although very likely it is not of the large aperture, which is almost a necessity in indoor portraiture.

D. M. C.—Generally speaking for a very long stay in a tropical climate an all-metal camera is preferable or else a tropical wooden model of teak specially made without any glueing. A Thornton Pickard shutter is a good choice since you could easily repair it. You should take a duplicate. A portrait lens would be a very unsuitable one for the work you have in mind, we should advise an ordinary R.R. of about 8 to 9 inches focal length for a half-plate camera or a 5 or 6 inches R.R. if you choose quarter-plate. Bromide paper also is the best material as regards keeping quality. You should have it packed in metal boxes. Unless you are going somewhere altogether away from civilisation, we should think you would do better to buy paper and plates from the supply houses in India. For film hardening take a supply of Ilford "Tropical" hardener obtainable from Messrs. Johnson and Sons, 23, Cross Street, Finsbury, London, E.C.3. Solid hypo will keep and so will a plain hypo solution, or, preferably, hypo with a little metabisulphite in it, for a reasonable time.

A. M.—1. It should not be necessary to stop a lens further than $f/16$ or, at the most, $f/22$ for copying work. A decent R.R. ought to work satisfactorily at $f/16$, supposing that the focal length is about 1½ times the length of the long side of the plate. You must remember also that when the distance between lens and plate is increased appreciably beyond the focal length of the lens, the stop number becomes greater and exposure requires to be correspondingly increased. There is a table in the "Almanac" which provides a guide to this increase of exposure, but you must not reckon your stop as $f/16$ or $f/22$, or whatever you choose to set it to, at all extensions of camera. 2. To make the best of the job rub the stick of Indian ink with a little water in a circular palette or saucer. This is a slow job, but it makes the best mixture of the ink. When you have a creamy paste through rubbing the ink and water you require to add a little syrupy gum and enough methylated spirit to make the backing mixture dry more quickly. Your method is, however, a very slow way of making the backing, you had far better buy the caramel prepared specially for making backing by Messrs. Lichenstein, of Silvertown, London, E., and purchasable through any of the large dealers in photographic chemicals.

The British Journal of Photography.

Line Advertisements.

Charges for Insertion.

Since advertisements cannot be inserted until fully and correctly prepaid, senders of line announcements are asked to bear in mind the scale of charges. They will thus save themselves delay in the publication of their announcements. A Schedule by which an advertisement can be correctly priced will be sent on request.

Net Prepaid Line Advertisements.

12 words or less	1/-
Extra words	1d. per word.

(No reduction for a series.)

Special Note. Box Number Advertisements.

"Box No." and office address	charged as 6 words.
For forwarding replies add ...	6d. per insertion for each adv't.

If replies are called for this latter charge is not made.

Advertisements cannot be inserted until fully and correctly prepaid.

Orders to repeat an advertisement must be accompanied by the advertisement as previously printed.

Advertisements are not accepted over the telephone or by telegram.

The latest time for receiving small line advertisements is 12 o'clock (noon) on Wednesdays for the current week's issue.

Displayed Adv'ts should reach the Publishers on Monday morning.

The insertion of an Advertisement in any definite issue cannot be guaranteed.

HENRY GREENWOOD & CO., Ltd., Publishers,
24, Wellington Street, Strand, LONDON, W.C. 2.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3098. Vol. LXVI. FRIDAY, SEPTEMBER 19, 1919. Price Twopence.

Contents.

	Page
Ex-Cathedra	541
Some Notes for Intending Patentees	542
The London Salon of Photography	544
Methods and Novelties in Enlarging. By Frank B. Howe	546
Forthcoming Exhibitions	549
Practicus in the Studio. By Practicus	550
Sulphide Toning with Polysulphide	551
Assistants' Notes	552
Photo-Mechanical Notes	552
Patent News	552
New Books	553
New Materials, &c.	554
Meetings of Societies	554
Commercial and Legal Intelligence	554
Correspondence—	
Eye-Glass Focussing Magnifiers	555
Answers to Correspondents	555

SUMMARY.

The exhibition of the London Salon of Photography, which opened at the Galleries of the Royal Society of Painters in Water-Colours, 5a, Pall Mall East, on Saturday last, contains a goodly proportion of portraiture and figure-study work both by professional and amateur photographers. This work is reviewed in an article on page 544. Next week we shall publish some personal impressions of the exhibition by Mr. F. C. Tilney, who will deal also with the landscape work at the exhibition.

In his article this week "Practicus" deals with the making and supply of miniatures, including in this category not only the hand-painted miniatures on ivory, but also the cheaper varieties of celluloid-faced miniature portrait, as well as the ceramic enamels. (P. 550.)

A paper by Mr. Frank B. Howe before the Californian Camera Club has dealt with some of the lesser-known branches of enlarging, and will no doubt provide much suggestion and instruction in this field, the appropriate season for which is now opening. (P. 546.)

In a leading article we endeavour to set before intending patentees a statement of the real value of the rights which they acquire when granted Royal Letters Patent. We also refer to one or two of the formalities to be observed in taking out a patent, of which there is undoubtedly much misconception. (P. 542.)

Particulars of a new description of flash lamp, namely, one producing the flash by the electric volatilisation of a metal, are contained in a recent patent specification. (P. 553.)

M. L. P. Clerc, in a note on the Desalme method of sepia toning with polysulphide, records his experience that the process is applicable to commercial papers in somewhat the same erratic manner as liver of sulphur. (P. 551.)

A paragraph in "Photo-Mechanical Notes" contains a suggestion as to the avoidance of moiré pattern in half-tone. (P. 552.)

A formula for putting labels on bottles permanently and the suggestion of a waterproof paint suitable for dishes and tanks are mentioned in "Assistants' Notes." (P. 552.)

Reproduction fees, photo-lithography, the Retail Businesses Licensing Order, refixing of prints, and the making of a lens-hood are the subject of brief replies to correspondents. (P. 555.)

Some of the things which may and may not be done in the use of bought specimens are the subject of a paragraph on page 542.

The preservative action of sulphite in a working developer is considerably reduced, with the lapse of time, by mixing the sulphite with the alkali, such as sodium carbonate in the separate solution of the latter. (P. 541.)

Very weak solution of potassium permanganate serves as a readily applied test for the presence of hypo in prints or negatives. (P.541.)

EX CATHEDRA.

Sulphite and Alkali. A point which recently came under our notice may be of interest to some of the many photographers who use pyro-soda developers. Our friend was complaining of the yellow tinge which pervaded all his negatives, and asked us to test a sample of the sulphite which he was using as a preservative. This appeared to be quite satisfactory, and the quantity which he was using should have been ample to prevent any discolouration of the solution. On investigating his methods we found that he was making rather concentrated stock solutions in considerable quantities, enough, say, to last a month or two at a time. When freshly mixed the developer was quite satisfactory, but it quickly deteriorated, in spite of the fact that he was also using acid bisulphite in the pyro solution. We found, however, that he was mixing at least half the prescribed quantity of sulphite with the carbonate of soda, being under the impression that the salt would crystallise out if it were all used for the pyro solution. Upon making a test with dry pyro and the carbonate and sulphite solution alone it appeared as if no sulphite were present, although three times the weight of the pyro was actually present. It would appear, therefore, that the alkali had practically destroyed the action of the sulphite, which had been kept in solution with it. On making fresh stock with all the sulphite in the pyro solution the trouble disappeared, and the developer worked cleanly to the end.

* * * *

Print and Plate Washing. If it be necessary to wash either negatives or prints for the minimum of time or the smallest quantity of water consistent with safety some means of testing the efficacy of the washing must be employed. For this purpose nothing is better or simpler than the well-known permanganate test, which indicates by colour the presence of a very small quantity of hypo. This may be conveniently done by making a stock solution containing one grain of permanganate of potash and ten grains of carbonate of potash to a pint of water. This will be of a rose colour, and will remain so for a long enough time if kept well stoppered. To use it, about an ounce of drippings from plates or prints, as taken from the washer, is collected in a clean measure, and a few drops of the permanganate solution added. If any appreciable quantity of hypo is present the pinkness will disappear almost instantaneously; if only a trace remains, it may take two or three minutes to discolour. It is a good plan, until accustomed to the test, to have a check in the form of a glass of clean water to which the same amount of permanganate is added as to the washing water. If this also decolorizes or turns brown it is a sign that the water supply is contaminated with organic matter. In that case a further test should be made with distilled water.

Buried Knowledge. In the course of a year many items of interest to the individual photographer appear in the weekly issues of the photographic press, but in the rush of work they are lost sight of, and when occasion arises to refer to them they are not forthcoming. We do not think that many people preserve—much less bind—photographic periodicals, and the result is that when a difficulty arises there is no course open but to address a query to the editor. This, of course, elicits a reply which is necessarily brief, and although the inquirer may be referred to a full discussion of his problem, the issue containing the article may have run out of print. To obviate this it is an excellent plan to adopt a simple method of filing such articles as the reader may feel interested in. A cheap and easy system is to procure a packet of strong manilla envelopes about 7 by 5 inches. On the outside of each is written a different subject, such as Bromide Printing, Intensifiers, Lens Matters, and so on, the whole being enclosed in any convenient box. It is now easy to cut out any article or paragraph, and to file it away for future reference. Small paragraphs should be pasted upon a larger piece of paper to avoid loss. Naturally, the file need not be exclusively photographic, but may contain many useful wrinkles and recipes for matters of household interest appearing in the daily and weekly newspapers. The file is better than a scrapbook as no pasting is required, and any required degree of classification can be arranged.

* * *

Print Surfaces. Many photographers place much of their best work at a decided disadvantage through neglecting to pay more attention to the surface of the printing medium. Years ago there was little or no choice allowed among the printing papers that were commercially available, but at the present time the reverse is the case. We find one of the best-known bromide paper manufacturers listing over thirty different grades and surfaces of paper, and such a selection of surface is of immense value to the discriminating artistic photographer in presenting his work to its best advantage. In ordinary portraiture the selection of the surface of the printing paper becomes of the first importance. For a dainty sketch portrait of a feminine sitter or a child there is nothing to equal a print on a smooth matt or cream base paper, while in the case of large head studies of elderly people a rough surface is decidedly pleasing, for it has the effect of breaking up rough patches of skin, of covering up much of the work of the retoucher, and of adding a texture to the print that is thoroughly in keeping with it. Moreover, as prints are nearly always of fair size, and are viewed from a distance, for such, a rough paper is in every way suited. Other examples could be cited, but enough has been said to show the photographer the real importance of discrimination in choosing the surface of his printing medium.

* * *

Bought Specimens. The ethics of exhibiting specimens which have not been taken by the photographer who shows them were discussed a week or two ago, but it is difficult to say what can be done in a general way. On the other hand, the facts of a given case scarcely ever admit of doubt as to whether the display is reprehensible or not. The question is an old one, for a generation ago it was the custom for such specimens to be openly advertised for sale, some firms of good reputation being willing to supply showcases ready filled. As far as we can see, all that can be done is for the various associations of professional photographers to make it a condition of membership that the practice shall not be indulged in, and even then it is difficult to draw a line. Many enlarging firms will supply specimen pictures, often at a reduced rate from their own stock negatives. In our opinion little harm is done by the use of purchased specimens, as the public quickly finds out that the work executed is not up to the samples shown, and the fate of the photographer is sealed. Again, what shall we say if, when a new style comes out, as in the case of sketch portraiture, anyone shows specimens made by a first-rate trade house, and afterwards supplies an inferior home-produced line? This is not uncommon, and we have often amused ourselves by picking out the trade specimens in a window show. A practice which cannot be too strongly reprehended is that of appropriating specimens sent by operators in answer to advertisements; this is neither more nor less than sheer robbery, which renders the offenders liable to prosecution.

SOME NOTES FOR INTENDING PATENTEES.

A TECHNICAL newspaper such as the BRITISH JOURNAL, like many others dealing with a subject which does not require a high degree of scientific study or technical training for its practice, is often called upon to give advice to its readers on protecting inventions, which they claim to have made, by taking out patents for them. As it is impossible to explain to individual inquirers at the requisite length some of the elementary matters connected with the taking out of a patent, we may turn aside for once from photographic topics and devote a few lines to putting forward a few essential facts which perhaps are not so widely realised as they should be. Unfortunately, it is not possible to refer such inquirers to text-books on the subject, for these latter are either comprehensive treatises on patent law, which it would take a lifetime to assimilate, or they are more or less informative manuals, issued, however, by patent agents, whose object is to encourage the inventor to get a patent granted for the invention.

Perhaps the first misconception, and the one most widely held, of the nature of a patent is that it is some kind of certificate or testimonial of the value of an invention. There are scores of people going about inwardly patting themselves on the back because they are the possessors of Royal Letters Patent, an impressive phrase which, however, means very little indeed. The real fact is that the Patent Office is a branch of the Board of Trade which, under the Patents Act, has very limited powers. It may, perhaps, be best described as a kind of glorified registry of the inventions which people claim to have made. It is a little more than this because it carries out a complex system of search among inventions which have previously been registered in its files in order to ascertain whether a given invention which it may be asked to register and to accept for protection by Royal Letters Patent has been so accepted and protected, in whole or in part, previously by somebody else. If it is found that there has been a prior invention, then the Office has the power to ask the later applicant to disclaim the previous invention and to show that his is something different from it. Moreover, if the applicant cannot or will not do this, the Office has the power to insert what is called a "reference"— that is, a mention of previously patented inventions which, in its opinion, are very closely allied to the later one. This "reference" is made in colourless official language without a trace of unpleasant suggestion in it, but in many cases such a reference is a condemnation of the novelty of the invention which might very well be put in forcible terms—say, those of Lord Fisher.

Apart from seeking to have an invention clearly described, this search among its records of previous inventions is practically all that the Patent Office troubles about. The invention may have been published over and over again in books or periodicals; on the face of it, it may be

an utterly ridiculous and impossible invention; or the means suggested for carrying it out may be manifestly absurd. So long as the patentee makes it clear what he really does mean, his "invention" cannot be objected to, and in the fullness of time it is accorded the dignity of Royal Letters Patent. These matters, efficiency, and real novelty are left to be thrashed out in the Law Courts. No doubt the reader has noticed in the prospectuses of industrial company flotations the importance which is laid upon the fact that a judicial decision has been given, in the course of litigation, on some patent which is an asset of the company. Failing that, the opinion of technical experts and counsel is sought by way of testimony to the value of the patent from the industrial and the legal standpoint. Many people, we are afraid, neglect these aspects of a patent and imagine, when the specification has been accepted and the patent has been sealed, that their difficulties are at an end. Very often they are only beginning.

There is really no reason why intending patentees should be ignorant of the limited value which a patent has until something has happened to establish its value. If they would study the "Instructions to Applicants for Patents," which is obtainable free from the Patent Office, 25, Southampton Buildings, London, W.C., they would detect for themselves the very small grounds on which the application for a patent can be refused. These grounds are of two kinds: (1) Certain things are excluded from protection by patent; and (2) refusal to comply with the formalities of the Patent Office. Under (1) are excluded inventions which do not "realise or affect" some material product of a substantial character. In other words, an invention must deal with some thing or substance, and not merely an idea or scheme. There are, however, a whole host of inventions which may be said to represent schemes or ideas, but which nevertheless secure protection by patent by being associated with some tangible means for carrying them out. Again, patent protection is not granted to the very limited class of inventions in which it is proposed "to use, modify, or imitate natural conditions existing on the earth's surface, there being no invention as to the means or apparatus applied to these purposes." Also protection by patent can be refused in the case of inventions the use of which is contrary to law or morality. It will be seen that when one has allowed a very wide field for the exercise f refusal on these lines, the possibility of obtaining a patent for almost anything one can think of is very slightly affected. If one wants to obtain a patent for making developing dishes of chopped straw and glue, there is nothing to prevent one from getting it. Even in the event of some other genius within the last fifty years having taken out a patent for developing dishes of chopped straw and glue, we can still have ours either by claiming, for example, chopped oat straw instead of the other man's wheat straw or Russian glue instead of Scotch glue; or, without making these disclaimers, allowing reference to the previous specifications (of wheat straw and Scotch glue) being made by the Comptroller of Patents. Such a case as this, which does not exaggerate the circumstances of patents which are frequently granted at the present time, however silly it may sound, will perhaps serve to make clear the extremely problematical value of a patent even when all the formalities have been complied with.

A careful reading of the official "instructions," to which reference has already been made, will enable the intending patentee to follow the correct course in making or pursuing the application for a patent, but one or two other points may be mentioned. Application for a patent may be made in two forms, either by depositing a "provisional" specification, which is a general and brief description of the invention, or a "complete" specification, which is supposed to be a description of the invention in its finished form. A "provisional" specification is provisional—that is, it requires to be replaced by the complete specification within six or, at the latest, seven months. During this period it protects the inventor in the sense that it establishes an earlier date for the invention than would very often have been possible if the inventor had to wait to work out his process or machine fully before making his application. At the same time it must be borne in mind that the acceptance of a provisional specification is of still smaller value than that of a "complete," for the reason that search for anticipation is not made in the case of provisional applications, but only when the complete description of the invention has been deposited at the Patent Office. It is, therefore, incorrect to suggest, as is sometimes done, that a provisional specification can be sealed. It is never sealed, but is either completed by the filing of the complete specification or is abandoned through the inventor thinking better of it in the six months' interval. Another point which leads many inexperienced patentees astray is the request on the official form of application for a patent to the effect that:—

"Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:—"

This means that the applicant must state briefly and clearly what is the essence of the invention, which he has already described at some length. For example, in making a toning bath, it may be the use of a particular chemical or a special manner of mixing known chemicals. Many people, however, will think they require to say what advantages they claim for the invention, and we have heard of inexperienced patentees drawing up claims such as "that it is unique," that "there is nothing like it on the market," or even that "£10,000 is its value." A study of the published specifications of similar inventions, which have been brought into correspondence with the official form in their passage through the Patent Office, will give a good idea of the way in which the claims should be drafted.

Generally speaking, in reference to inventions of photographic apparatus and accessories such as may owe their origination to the ingenuity of individual professional or amateur photographers, we regard the taking out of a patent as a means of warning that the originator is alive to his rights in it. The taking out of a provisional patent at the cost of £1 is sufficient for this purpose. Although it does not permit of legal action being taken until the patent has been granted, nevertheless the inventor is in the position to protect himself from any unscrupulous pilfering of his idea by anyone to whom he may show it in confidence. On this account many of the manufacturing houses adopt the practice of declining the disclosure to them of an invention until the applicant has applied for patent protection. By so doing they acquit themselves of any suspicion of being anxious to benefit by the inventor's unprotected state. Unless an invention contains some really substantial commercial prospect it will usually not be to the inventor's interest to pursue his protection very far. After the completed specification has been accepted and the patent sealed, the patent rights may be disposed of to the firm which has offered to buy them, and the question of the further payment of taxes for the purpose of maintaining the patent in being may be left to the purchasing firm. Presuming that an inventor is content with a modest recompense for his ingenuity in the form of cash for his rights, there is no doubt that there is a constant demand for inventions of the hundred and one accessories for use in photography, the sale of which flourished in this country before the war, and will doubtless flourish again.

THE LONDON SALON OF PHOTOGRAPHY.

PORTRAITS AND FIGURE WORK.

We cannot direct our readers to more than two or three things of remarkable power or novelty amongst the portraits shown at the annual exhibition in Pall Mall; but we promise that a visit to the show will be repaid by the interest nearly every print displays. The average of merit is a high one; a state of things which has now happily become usual in these shows. Perhaps this is because photographers are at last a little shy of surprises, as surprises, and are turning their attention to results that are artistic in the true sense of the term.

The outstanding exhibit, to our minds, is the collection of work shown by a professional photographer of Bath, Herbert Lambert, who sends half a dozen portraits that are really arresting on account of their technical merit, and the simple and straightforward methods they reveal. It might perhaps be admitted that they are conventional; but from a professional point of view that is no disadvantage if the work has "pull."

A mild sensation may exist in the fact that the Queen of Roumania's signature distinguishes her portrait shown by Bertram Park. Beyond this there is nothing needing exclamation marks in the work contributed by British professionals, which include Marcus Adams, Angus and Maud Basil, Charles Borup, Hugh Cecil, William Crooke, Mrs. Corke, A. Keith Dannatt, Miss Vandamm, C. Vandyke, H. Van Wadenoyen, and C. Zilva.

Taking a systematic tour of the galleries and breaking off here and there to follow up an exhibitor's work, we find first a spirited portrait of "The Rt. Hon. the Earl of Carnarvon" (1), by F. Seyton Scott. As a virile character-study this is very successful. It has the distinction of amateur work. We do not mean that it is amateurish, far from it; but it has the sly snapshot look which is totally at variance with the reposeful presentment that lies in the principle of professional work. We are disposed to believe that the momentary expression, sometimes animated to the degree of spoiling the normal likeness, which the amateur style chiefly involves, is less desirable than the monumental principle employed by traditional workers like Crooke. "Study of a Head" (14), by Marcus Adams, exhibits a tendency for over-modulated backgrounds in this gentleman's work. "Daddy's Sweetheart" (129) is a particularly sweet child, and the print seems to have been treated with a consistent sweetness that recalls a little the surface of a wax or china doll. Perhaps the nicest of these child studies is "Peter" (171), a profile, because it is the strongest, although "Betty" (174) is prettier. But for character Mr. Adams has done nothing better than "Mischief" (181), a girl in a print dress. "Simplicity" (182) completes the list of a series that must inevitably redound to the credit and profit of their author.

The evergreen dodge of placing a sitter in the dark against a veiled window has given Hugo Van Wadenoyen his "Silhouette" (17), which certainly offers a fine pattern. Fortunately he has provided sufficient reflected light to give interest to planes and details within the silhouette. In "Betty" (132) he avails himself of another stock-in-trade—namely, the shadow on the wall. He rises to his highest level of style, however, in "Lady with Striped Scarf" (148), the broad and simple treatment of which is imposing.

When N. E. Luboshez sent two epoch-making portraits last year to the R.P.S. show, we thought that portraiture by photography had found a leader to "go over the top" and take all the squad with him. But he has come back into the trench again, and we are all where we were. His work is marvellously strong, of course, but he has not been so happy in the selection made by the Salon as he was in the R.P.S.'s choice last year. "A Study in Lighting" (37) is the best of his prints. It is the portrait of a gentleman the brim of whose hat shades his face below his eyes. The modelling is very strong and artistic, and the whole thing is Rembrandtesque in feeling and aim. If he had sent nothing else at all he would have done wisely. The other prints fall away from this and from his previously exhibited work. "Portrait" (165) is comparatively flat in materialisation, and the lighting is not consistent, nothing but the face receiving any illumination at all. "N. Tchaikowsky" (274) likewise wants roundness, and although really fine in a general way, is rather dull. "Study" (314) is a bearded head only of the sardine skipper variety. It has virility and power of handling.

Handwork is the chief feature of Jane Reece's profile of a boy in a large hat, entitled "In Spanish Vein" (38). We must confess that to us neither the youth nor his portrait appear more in the vein of Spain than of Holland or Mexico, or any other place. We may be wrong, but the only effect the swirly scratches on the background around the brim of the hat appear to have is to make the background envelop the head instead of remaining behind it. We much prefer Miss Reece's saner portrait "My Mother" (52), which, though rather too fuzzy for its small scale, has much quality and charm.

Angus Basil was out for contrast when he produced "Yvette" (45), the study of a pretty young girl with "bobbed" hair and bare legs, dressed with some brevity in a white garment, and standing against a black curtain. But the effect is striking and in perfect taste. There is admirable character in his "Liev Leonoff" (267). Maud Basil's "Sisters" (56) is a print which has attracted considerable attention on account of the strong effect afforded by the large field of beautiful middle tone, the dark note of the hair, and the brilliant halo effect where the back lighting shines through. We also confess to being charmed, but are disposed to think the scheme a specious one. The hair suggests the badger. But as to the quality in the half-tones there is no doubt whatever; neither is there any as to the happy posing of the two girls, one looking at the other, and the other looking at the spectator.

Walter Lee's "Yank" (50), a full face in the goggles which have already invaded these islands, is masterly in its way, but inexplicably low in tone. Two nice little boys form the subject of "The Brothers" (81), by George Spiers. This print has an effective treatment, embodying the ropy texture of background now popular.

Hugh Cecil's two portraits are similar in character, a "pair," in fact. They are "Margaret Morris" (79) and "Portrait" (89). Although posed with the skill for which this worker is famous, they appear to us to suffer from the treatment he has adopted in rendering their tones in flat areas bounded by rather hard edges. Even the bare shoulders of "Portrait" are not permitted that roundness and modelling which are, after all, the charm of shoulders.

"Miss Marjorie Hume" (91) is a portrait by the amateur, J. C. Warburg, but quite in the professional manner. It is extremely nice in its varied tones. Another amateur, the Rajah of Sarawak, sends a well-rendered vignetted head of a native girl, something less than an absolute profile, in which the fine texture of the head-dress is really the most remarkable part of the achievement. It is called "Malay Girl, Sarawak" (106).

One of the most engaging portraits here is "Madeleine" (111), by Herbert Lambert. It is only surpassed by "Portrait" (204), a head and bust of great beauty. Madeleine is a print of a young girl, of charming simplicity. In style it is broad and masterly. The more mature lady of the "Portrait" is

rendered with less unconventionality; but its charm is no less irresistible. Mr. Lambert is content with what his negative gives him, and one could not, in his case, wish for any modifications. "Molly" (201) is a child whose hair has a stripey appearance which we are not quite sure that we admire. But a vignetted head, called "Profile" (207), shows a style of clean delicate tones, and a most artistic management of contours.

"Her Royal Highness Princess Ileana of Roumania" (127) is one of Bertram Park's distinguished sitters. He has given her much charm, in spite of a scheme of lighting which proclaims itself as undoubtedly artificial. As a matter of fact, the tone values are not at all what natural lighting would give, but it is plain that such matters are not considered in Dover Street. "Nevinson" (133) is a very clever study in a style of retouching by which Mr. Park has recalled the "cubistic" touch of the painter. Its merit lies in the fact that, although it is very demonstrative, it does not much damage the modelling. Next we have the other royalty, "Her Majesty the Queen of Roumania" (189), a first-rate work, having the distinction of style that is its due.

Waldemar Eide works in Norway. His "Stefan Partos" (134) is a beautiful little costume portrait of a young gentleman of saddened and serious mien. To us the portrait appears to be eminently fitted for a conception of what the Chevalier Grieux might have been. "Madame Vera Fokina" (266) maintains a dignified pose suitable for a Roman matron. In fact, this clever photographer is eminently strong in the picturesque characterisation of his sitters.

Wm. Crooke sends three examples, the best of which, by a long way, is "Sir Henry Wood" (188), for it is a strong conception of a virile subject. The lighting is forceful, and the expression is of that settled and serene kind which, though it demands repose of the facial muscles, does not relinquish the look of mental alertness. Mr. Crooke has turned the fur collar of the musician to good account. More conventional in style and pose is the upstanding figure of "The Right Hon. James Avon Clyde, K.C., M.P., Lord Advocate" (240)—all that, as the gentleman's bearing suggests. Perhaps, if the work is a presentation portrait, it is right that it should. The "Portrait of an Old Lady" (308) misses the full measure of quality that is usually found in Mr. Crooke's works.

A very dull, but uncommonly good character study of a stalwart gentleman, "Peter Cornelius" (209), seated and tranquil, comes from C. Zilva. The Earl of Carnarvon shows a good motive in design with the bending lines and inclined head of "Madame Karsavina" (214), a sad-looking young lady. Florence Vandamm contributes a small print, "Mica Micum" (230), a lady evidently of character. Here she rather appears to be suppressing some violent emotion. Compressed lips and distended nostrils may be characteristics, and may make for likeness, but we doubt the advantage of carrying these considerations beyond those of the more alluring charms of a sitter. Miss Vandamm's "G. R. Thomas" (348) is all that can be wished for in this respect, with its sober style and gentle lighting. The cigarette is a happy touch.

We have always looked to Louis Fleckenstein for work instinct with high artistic aim and feeling, and his present exhibits do not disappoint us. In "Betallo Rubino" (258) we see again that large and simple style to which we have already referred in Mr. Lambert's "Madeleine." It gives to Mr. Fleckenstein's portrait the look of a drawing by an old master. In fact, the thought it brought to mind was that of one of Raphael's Madonnas; for the work has the same quiet and noble demureness. Similarly, we are reminded of Rembrandt in the tone and the style of "Miss Lucille S." (315). With pose dignified, and lighting simple and effective, this portrait sets a fine example for nobility of treatment.

There is something delightfully quaint in Ford Stirling's "Miss Chichester" (247) whose bent elbow seems to have been the cause of the slim figure's one-sided position on the print. The clear, gentle tones and manner of lighting show a refined taste. We cannot say quite so much for Margrethe Mather's joke of getting spots of high light on the goggles of "Edward Weston" (259). "Magda A." (264) is another welcome example of the simple and broad style by Aage Remfeldt, who also has achieved a capital pose and a sweet expression in "Miss A. A. R." (304), which, however, is needlessly dark.

A portrait of much quality, though a little wooden in the neck and body, is Arthur F. Kales's "Miss Julanne Johnston" (269), a profile figure with full face, nicely lit. Otto C. Schulte, in his "Portrait of Miss B." (270), makes what is, in our mind, the mistake of putting the sitter so near the background as to muddle its contours against the cast shadow. In "Portrait of a Lady" (286), C. Vandyk shows us one of the excellent productions of his studio, but it calls for no special remark. Yvonne Park employs the resource of the bright edging of light through the texture of fur in her pretty "Girl's Head" (296).

Originality is the keynote of Dora Head's "Pals" (298). This is the head and shoulders of two laughing youths, one of whom has a pipe in his mouth. It is a capital piece of life and animation. Equally good in its way is Chas. F. Emery's "Disdain" (299), a splendidly strong presentment of a girl's head thrown back in what to us seems more like impertinent airs than disdain; but the expression is well given, however it be named. Another original and lively work comes from Chas. H. Davis, "Mr. Otis Skinner (in character)" (320). The figure stands with folded arms and a perky smile, and is, presumably, Micawber, to judge by his costume. Similar excellencies are in J. A. Gardner's "Old Yankee Farmer" (420), but here the character is genuine, not assumed. The wit and good nature in this face under its battered hat makes it a triumph.

"Eileen" (322), by Estelle, is a young girl seated, in profile, but looking round demurely at full face. The expression is delightfully childlike. Another nice demure pose is given by Charles Borup in "Phyllis and Crinoline" (338), quite a pretty picture. Character, happy expression, and pose, and an excellent, quiet style distinguish "E. Haynes, Esq." (339), by Nicholas E. Smirnoff. Henry B. Goodwin also shows a fine head stylishly treated in "His Excellency M. Thiébaut" (401)—a splendid portrait for ambassadorial purposes.

Our remarks so far have been all in praise; but we must record our disagreement with the aim of Grace S. Parrish, whose "Decorative Portrait" (432) seems to us nothing but a regrettable absurdity. Its "decoration" consists in its being all eliminated in a washed-out way, except for a few hard lines; whilst the background is scrawled with some very ill-drawn figures in outline.

Fortunately the Salon has not admitted much with which a sane mind can quarrel. Among the figure subjects that are not portraits pure and simple, some specially fine pictorial work is to be seen. We must refer to a few of the most striking.

The visitor will admire the Earl of Carnarvon's study (9) representing a lady in a shimmering robe. The face is delightful, and the pose most cleverly given a sort of list by the extension of the sitter's right arm under the drapery. A rather fleshly nude, posed with an abandon worthy of Titian, comes from Henry B. Goodwin. It is called "The Tired Model" (18). Our only criticism is that the modelling is faulty, a kind of mottling in the tone having upset all the delicacies of shading and prevented any idea of roundness. F. J. Mortimer's "Naiad" (30) is similarly unrealised, but it is a remarkably clever piece of picture-making. He has been faced with the problem of tone accents; the body of the girl, who stands back towards us at the sea's edge, contesting the high-lights of the breakers beyond. We think that sharper and darker touches of shadow in the figure would have effectively given her prominence; and it would have done so without robbing either her or

the waves of the high-lights. Waldemar Eide's "Idol" (64) is well posed, and the "make-up" of the eyes is wonderful. The "Swastikas" on the background should commend this design as a poster to the National War Savings Committee.

Never since an enterprising American years ago produced prints in the scrap-album manner have we seen so much "too solid flesh" in a single picture as in Francis Jay's "En Arcadie —Dessin pour Eventail" (84). It is really a cleverly composed scene of nearly a score of nude damsels disporting at a woodland stream; but as a design for a fan we fear it would be disastrous. The fan would be about fifteen inches long with about two inches of handle. Its lines are not arcs either. Mr. Jay should have called it a design for a "lunette." All such designs are for lunettes: no other decorated architectural space is ever provided for. It would be interesting to see (from a distance) the lady with moral courage enough to display this fan at a respectable social function.

A pretty picture is sent by T. O. Sheckell of a young girl daintily holding her skirts by her fingers, with sunlight behind her. He calls it "At Sweet Sixteen" (120). Another lighting study, and one of particular merit, is Ed. Weston's "Paul Jordan Smith" (152). This represents a young man leaning against a wall upon which a strong light falls from behind. In the midst of the cast shadow the photographer has introduced the further complexity of a mirror which reflects the head, whilst, of course, cutting out all the shadow by the light it also reflects.

We admire Angus Basil's "Mdlle. Dyta Morena" (173). It is a kneeling figure with arms outstretched. A shadow from the hands falls upon the face. Girls, with a certain liveliness, sitting on stools, form the subject both of F. J. Mortimer's "Chippy" (70), nicely designed but dark; and "On Dit" (197), by Andrew Barclay. F. Flodin attempts a portrait of "Sir Walter Raleigh" (206), which is by no means a bad fancy. We were disappointed to find that what we first took for a corn-cob pipe in his mouth was really only a rectangular shadow in his ruff. The idea of imaginary portraits is one that should supply resourceful amateurs with interesting objectives.

A curious flat print, full of anomalies in tone, has been sent under the name of "Sepulveda" (218), by Jose Ortiz Echague. It comprises two Spanish peasants who effectively resemble cut-out fire screens, since they have but two dimensions. The thing is inexplicable and not beautiful. Another queer picture is "Need" (223)—three ladies holding each other up in what appears to be an attack of *mal de mer*. Photographically, however, it is first rate. J. Falkengren is responsible for its merits and defects. "When I sit alone and think" (233) is Mrs. Barton's title to another two-dimensional effort depicting a girl in a wood. It is flatter than the flattest primitive art, and looks like a piece of tapestry. We do not need to sit alone to think that Mrs. Barton would do wiser to recognise the existence of space and air. What a lifting of spirit one finds in turning to such a living, human piece of work as "Idle Moments" (238), by C. J. Marvin, who gives us a darky boy sitting by a wall! The lighting and beauty of the tones in this picture are a joy. Light again is the burden of Louis Fleckenstein's song in a rocky view where a girl is gracefully posed. He calls it, in fact, "Play of Light" (263). In such directions as this there is illimitable promise of progress. To ape the incompetence of the past cannot be profitable in any respect. Mr. Fleckenstein is happy again in his "Elizabeth Kislingbury" (385), where the subject is the illumination of the figure by reflected light.

Two splendid studies of Japanese actors, in all their wondrous "get-up" of mask and wig, are sent by C. P. Crowther. The characters are, we understand, participators in some national ritual dance, and the prints are called "A 'No' Performer" (268 and 283). Among R. Polak's several interesting costume pictures after the style of Dutch art is a weird thing: a head of a bearded man lying upon what might be a "charger." But the head can never be that of the Baptist; we presume it is meant for that of Holofernes. Mr. Polak simply calls it "Study of a Head" (349), which is rather a "let down."

Perhaps the best of the many dancing subjects here, to turn from grave to gay, is W. Eide's "Dancing Study" (428), a print of rare quality. The pose is positively new, exhibiting all the vigour of a figure balanced on one foot, but devoid of the ill grace sometimes characteristic of this kind of posing. The shimmer of a silvery garment around the figure is a splendid detail in the scheme.

There are a quantity of most engaging baby-studies here also, all good, but scarcely requiring separate mention.

We have, indeed, not dealt with everything that deserves praise. Several nude studies, for example, the excellent contributions of Mr. and Mrs. Bertram Park, will be spoken of at some length in Mr. Tilney's article to appear a week hence.

As a show of professional and amateur portraiture we are sure that the Salon will repay a visit from all whose desire it is to see how the world wags and glean valuable suggestions.

METHODS AND NOVELTIES IN ENLARGING.

[A recent talk by Mr. Frank B. Howe, before the Californian Camera Club, the text of which is published in "Camera Craft," concerned itself chiefly with some of the by-paths of enlarging, and thus dealt with a number of methods which are comparatively little known by users of the enlarging process. We reprint portions of Mr. Howe's talk. The parts omitted are those which cover more or less familiar ground.—Eds. "B.J."]

Those of you who, like myself, enjoy having a little place fixed up in the cellar or the garage, a place where you can splash around, spill hypo to your heart's content, and otherwise enjoy yourself without incurring the horrified and sarcastic displeasure of your immediate family, will be glad, I think, to know that it is possible to have an enlarging apparatus which does not require an arc light, a Cooper-Hewitt tube, or daylight. Neither is it necessary to cut a hole in the wall or block out a window in order that it may be installed. Briefly, the apparatus may be called a Mazda lamp enlarging illuminator. A box about eighteen inches square and eight or ten inches deep is built, leaving one of its large sides open, as, in use, it stands on one of its narrow sides. Mirror glass is attached to the inner surface of the back and four sides of this box, completely lining it with reflecting surfaces. In the centre of the back a hole is cut to accommodate an ordinary electric light socket, and four other sockets are also fitted, two on each side, so that the four lamps, when screwed in, will have their ends about an inch from the central one. By using two pieces of mirror to line the back of the box the glass dealer has only to pinch out two semicircles, one in each half where the two come together down the centre, and so doing will be much less expensive than cutting a round hole in the centre of a piece large enough to cover the entire back. The same applies

to the sides. These large blue lamps, seventy-five watts I think they call them, are the best, and comparatively inexpensive. On the front of this box is built a framework, with cleats inside holding a sheet of ground-glass. If, later, one sheet is found to be not enough, more can be added. To the front of this last is added still another frame, one somewhat like a picture frame, with its inside opening just large enough to take the back of your camera snugly. That is all there is to the apparatus. You then simply put your camera in the opening, after having first removed the ground-glass focussing screen, slip the negative into a plateholder from which the septum or centre has been removed, and you are ready for business. In cutting away this septum, leave about one-eighth inch of the material for support around the edges. A film negative can, of course, be placed between two pieces of clear glass fitting the holder, while a smaller negative can be placed in a carrier or attached to a clear glass. If you are using a Kodak or other camera that is without a plate attachment, you can make the section carrying the ground-glass a little wider and cut a slit in one side so that the plateholder carrying the negative can be inserted there.

For enlarging, the speed of the lens is not as important as is flatness of field, and any lens which gives the latter will do. The ideal lens for enlarging has a focal length equal to the diagonal of the plate lens, so makers agree in telling us. You will understand that I am touching on this subject of lenses only briefly, because it is one that is covered in innumerable books and articles very much more interestingly and at greater length than I can hope to achieve. If your only available lens is a rapid rectilinear—and haven't we all, put away somewhere, whether we admit it or not, such a lens for which we have a secret fondness that we never will have for the finest anastigmat made?—if, as I say, you have only such a lens, do not think you cannot make good enlargements with it, for you can. But a good anastigmat is the better optical equipment; if you have one, it is the lens to use.

So much for the equipment. Let us get down to the actual making of the print. You doubtless have no trouble with straight enlarging, so we will proceed directly to the matter of exposing, with special consideration to so-called fancy printing. The soft-focus or mezzotint effect, which is the result of a diffused picture from a sharp negative, is easily achieved in enlarging. We first focus sharply, then rack out the lens until the image is slightly out of focus, place the paper in position, open the shutter, and give about one-fourth the exposure, after which the lens is drawn back into the sharp-focus position and the balance of the exposure given. Of course, the proportioning of the two exposures will vary with individual pictures; but one-fourth soft focus and three-fourths sharp seems best to fit the average case.

And, by the way, let me urge you to make, if you already haven't one, a transparent yellow cap for your lens. With it in position you can place the paper on the easel and focus right through the yellow screen without danger of fogging the paper, thereby seeing just how you are placing it on the paper. There are not a few advantages in using this screen. You can make one in a few minutes by taking a lens cap, cutting out the top and gluing a piece of orange Kodaloid over it. If you haven't any Kodaloid at hand, run a piece of undeveloped film through the hypo, wash it and soak it in red ink until it acquires the proper depth of colour.

Those wide-border, countersunk enlargements which have become popular of late under the names of Velvetone, Brunertype, and the like, are easily made, and beautiful in effect. They are produced commercially on platino-matt paper, through a Verito lens; but, if you haven't a soft-focus lens, you can get a like effect by making the exposure with a stretcher covered with silk bolting cloth moved around about half an inch in front of the paper while the exposure is being made. Leave four or five inches of white border around the picture and develop for a cold grey tone, using not too much bromide, nor, indeed, too little. Brown and green tones do not look well for this type of print. Let the image develop slowly, with good brilliancy, and, above all, be sure to so expose that it takes full development. Take the dry print, lay it over a sheet of glass with a light underneath, place a sheet of heavy celluloid, cut the right size for the desired "plate-

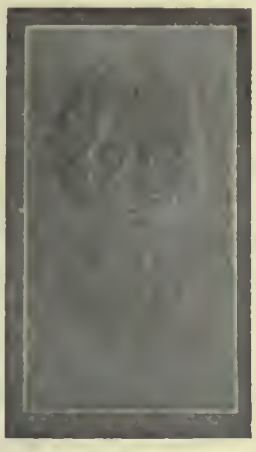
Etching Effect.

Gum-print Effect.

sunk" effect between, and rub down the outside margin, thus countersinking the picture. The celluloid, being transparent, facilitates the centring of the picture; and, for rubbing down, one of the ball bearing embossing tools is fine; but, if not available, you can get the same result by using an old toothbrush handle. Then trim the print to get neat, clean edges, and you have a beautiful picture.

To make prints resembling an etching, make a positive from your negative, using a process plate. Reduce it, getting it pretty thin, and flow the back with ground-glass substitute.

From Original Negative.



Bas-relief Effect.

Then lay this over the negative, with a light below, and on the ground-glass surface sketch in the picture with pencil. Then make a negative from this and from this last you can make a straight enlargement which will have the etching effect. It sounds complicated, but try it, and you will find it is really very easy to do; and it gives a novel effect, one that is very pleasing.

A bas-relief effect can be very easily obtained in enlarging. Make a positive on a plate or film—commercial film is fine—getting it as near as you can to the same density and contrast as

the negative. Put the two together, face to face, keeping them slightly out of register; make a negative, slip it into your enlarging camera, and proceed as for an ordinary enlargement.

If you like gum prints, but do not like the work connected therewith, or if you lack the time necessary, you can get the same effect quite easily by straight enlarging. Make an enlargement, getting it about three shades darker than you wish the picture to be. From this, by contact, make a paper negative. Soak this in a solution composed of eight parts of castor oil and two parts of ether. Incidentally, do not inhale too much of the ether, or the world may be deprived of the beautiful picture you are about to produce. And do not forget to keep the bottle tightly corked or the ether may go away and leave you. After soaking the paper negative in this, blot it, place between dry blotters, and use a hot iron until it is dry. Then make a contact print from your paper negative in the ordinary way, and you have what is, to all appearances, a gum print. I might add that this is the basis for the so-called "Qualitone" prints that I am making commercially from amateur negatives. To make them commercially practical, we have completely to reverse the process, so that, as now used, the method would hardly suggest the parent idea. But just as the above process is impractical for commercial use, so is our method impractical when only a few prints are to be made, and therefore the outlined process is the one you will want to use.

To come back to bolting cloth for a moment. There are all sorts of possibilities in that material. You can put it on a stretcher and, by holding it in contact with the paper, while exposing, secure a delightful canvas or linen effect. By keeping the stretcher from a quarter of an inch to an inch away from the paper, you can get softness without losing detail or producing diffusion or fuzziness. Using the bolting cloth will necessitate about a third more than normal exposure. And be sure not to get cloth that has been folded or there will be a corresponding line in the picture. You can buy the cloth in rolls, glue it on the stretcher, and thus eliminate this difficulty.

Softness can also be secured by exposing through a lens cap made like the yellow one described, but covered with silk chiffon instead. While the chiffon is a department store commodity, it is well worth braving the peril attending its purchase, for it is very satisfactory as a softener. Still another method of softening the picture is to wave a piece of ground-glass or ground celluloid as close to the lens as you can during exposure, the ground side being towards the lens. If too much diffusion is thus secured, do it for only a part of the exposure.

To produce white borders on enlargements is a problem that has two solutions. You can either use a mask having an opening the size of the enlargement, using it against the paper, or mask the negative. The former produces a sharp edge which looks all right when the picture is sharp, but one that to me seems out of place and inartistic for a soft picture. It is somewhat more trouble to mask the negative exactly than it is to mask the enlargement; but I think that, in most cases, it is worth the trouble, for the softness so gained is in proportion and harmonious with the softness of the picture. Sometimes, though, when an excessively long exposure has to be given, you will get halation unless you use the larger mask in contact with the paper. To eliminate the sharp border objection noted above, you can use both, fitting the mask against the paper very accurately so that it will come about one-sixteenth of an inch outside the projected image all around. Frequently, of course, you will not care about the border, and then, naturally, it is a waste of time to mask the negative, it being only necessary to slip a mask over the paper. The other plan is suggested as being more artistic and satisfactory in most cases.

Now, before we go on, just a few words about vignetting. If you do not like the vignetting affair that is on sale, one that looks like an instrument formerly used for scaling fish, try some other method. The best known is to use a piece of cardboard somewhat larger than the enlargement being made, in which has been cut a hole of the general shape and about half the size of the desired vignette. By making the exposure through this, holding it about half-way between lens and paper, and moving it about to avoid a sharp edge, you can produce nice results. Or you can cut a hole in the cardboard about the size you want the vignette, pin it over your bolting cloth frame, and use it close to the paper—about half an inch away.

As to developers, you are pretty safe in sticking to what the manufacturer recommends. Any developer that gives good brilliancy and works with average speed will do. Bromide enlarging requires slow and full development for best results. The proper use of potassium bromide is very important in enlarging—more so, I think, than in printing, where it does not matter so much what tone results. Under-exposure and forced development are less disastrous than the reverse. If a print refuses to come up with proper brilliancy, you can sometimes "snap it up" a little by adding to every five ounces of the normal elon-hydroquinone developer, the following solution:

Bromide of potassium, saturated solution ...	6 drops
Nitric acid, C.P.	2 drops
Prussiate of potash, red.....	3 grains

There is another way to "snap up" a developer, but I hesitate somewhat in telling it, for I know you will say, "Heavens! Did they bring that man five hundred miles to tell us to put hypo in the developer?" But I will bravely suggest that, when a print positive refuses to come up with the desired snap and brilliancy, you add, as a last resource before giving it up, one drop of a 25 per cent. solution of hypo to each ten ounces of developer. A friend of mine to whom I made this suggestion understood me to say one ounce. He hardly got the results he expected.

Local development, or the hastening of development in some one part of the picture, can be used, in connection with shading and dodging in exposure, to correct uneven densities in the negative. The best way I have ever employed, and one I have never seen described in print, is: Take a bottle and fill it with undiluted stock developing solution, and, instead of a cork, use a wad of cotton in the neck. Then, during development, simply hold the bottle upside down and rub that portion of the image it is desired to strengthen, while the rest goes on normally. This has the advantage over local rubbing, heating, and the like methods, in that there is no danger of staining, since the print is kept fully immersed in the developer during the entire process. Still another plan is to blow upon the desired part through a tube, and thereby keep a current of air upon the portion it is desired to speed up. This last is particularly useful in building up small places, while the bottle with the cotton stopper is more useful for large areas.

A good little "stunt" that is most effective, particularly when making small enlargements, where it is difficult to shade evenly, is this: Put the paper in an ordinary printing frame behind a sheet of ground-glass facing out—that is, with the ground surface away from the paper. You can use celluloid with a ground surface by placing a sheet of clear glass between it and the paper. Put the frame in position on the enlarging easel, and focus. With the focussed image projected through the yellow cap, dab a little vaseline on the ground-glass at places where more exposure is wanted. Rub it in well to get it even, and expose. The vaseline makes the ground-glass transparent while the ungreased parts hold back the light. Similarly, you can hold back certain parts still more, if neces-

sary, by rubbing finely powdered green chalk on the ground-glass surface directly over them.

I have a suggestion or two to make regarding re-development that may be worth the time required to mention them. In the first place, by lessening the amount of bromide in the original developer you can to a great extent eliminate the disagreeable tone of yellow in the sepias. Or if you are making black and whites at the time, and cannot therefore cut down the bromide below normal, try soaking the print in the sulphide solution of the re-developer before bleaching. In fact, I believe that the latter plan is, after all, better than varying the bromide in the developer. I can positively guarantee, if you will soak the print three minutes in the re-developer (sulphide bath) before bleaching it, that not only will you get a beautiful chocolate brown, with no trace of yellow, but that the density of the sepia print will be exactly the same as was the black and white. These two advantages are rather big ones, and well worth while.

Do you occasionally get blue spots in the paper after sulphiding? Try adding a little oxalic acid and oxalate of potash to the sulphide solution. It doesn't always work, but oftentimes will save a picture. A fresh sulphide solution occasionally eliminates the trouble. And here is another "stunt" that may be worth while. To produce pictures that are part sepia and part black and white, get a ten or fifteen cent. tube of what is called "Jiffy Solution," used for mending bicycle tyres, and pour some of this over the parts you want to remain black and white during re-development. It dries quickly and is easily peeled off after the print has been redeveloped in the usual way. With a little judgment you can use this solution to produce some delightful effects—warm toned faces and arms with cool toned drapery; warm sunlight splashes with cool-looking shadows, and so on. A plain collodion, such as the druggists sell, might answer as well or better; I have not tried it.

Now, a few miscellaneous hints that may be of use to you, and I am through. To remove a scratch on the glass side of a negative, make a fine thick paste of emery powder and water, apply with a piece of flannel and rub until the edges of the scratch are literally cut off. The scratch will not show in the print, and this is quicker than spotting, particularly if a lot of prints are to be made from one negative.

To hold back faces and other small areas that print too dark, two methods are applicable. Use a piece of cardboard on the end of a wire—a hat-pin is good—taking care to move the wire sufficiently to avoid its making a light streak on the print. If the exposure is not long enough to permit enough of this dodging without it showing on the print, stop down. And speaking of stopping down, quite often you can increase contrast by stopping down judiciously. As a rule, however, in enlarging, a stop about $f/16$ is ideal; and I think we are safe in saying that an exposure of not less than fifteen seconds is desirable. The longer the exposure required, the better for the picture, if you have the patience.

The other method consists of using a narrow strip of glass with a spot of opaque on one end. This is somewhat better than the cardboard and wire method, for it cannot produce a white line if you neglect the moving, as the exposure goes on right through the glass.

Double printing should not be overlooked, as enlarging offers the widest possible field for its application. And here is where the yellow cap is again indispensable. Put the negative in place, with yellow cap on lens and paper in position. Then fit up a strip of cardboard to shade the sky portion, fastening it a little away from the paper so that there will be a soft, vignetted edge to the landscape, not a sharp outline. Mark where the sky line comes at the two sides of the picture, make the exposure and remove the negative. With the yellow cap again in position, the exposure having been made by removing it, locate the clouds just right on the paper, using the pencil marks at the sides as a guide. Move the masking cardboard to the other side to shade the part already exposed, and print in the clouds.

To get a negative which, when exposed in contact with the picture negative, will give a canvas effect: Get a piece of hair-cloth from the tailor, set it up so that the light strikes across it from one side, and photograph it, developing for contrast. A quick-acting reducer will sometimes improve such a negative and prevent its making the exposure too long when in use.

Occasionally you will want to make a particularly nice-looking job of enlarging one figure from a group, and here is a good method of procedure. Make a regular enlargement from the group negative, place it in an ordinary printing frame with a sheet of clear glass in front and the picture side of the print towards the glass. Mix opaque and whiting until you have a very light gray substance. Paint this all over the glass around the figure you want to separate from the group, just as you would were you blocking out a negative. Next put a deposit of soot all over the glass, opaque and all, by holding it over a kerosene lamp. Carefully wipe away the soot from the clear glass over the figure, and then work in some shading or design around this clear space by wiping off the soot so as to leave the gray opaque showing through in places. After you have a nice background design worked in, copy the whole thing through a sheet of glass. Have a piece of black cloth, with a hole cut in it for the lens, suspended in front of the camera in order to prevent reflections from the glass. The result will be a nice negative of the desired figure, with a tapestry effect background; that is, if your work with the gray opaque and the soot was well done.

FRANK B. HOWE.

FORTHCOMING EXHIBITIONS.

September 13 to October 11.—London Salon of Photography. Hon. sec., 5a, Pall Mall East, London, W.C.1.

October 13 to November 29.—Royal Photographic Society.—Entries close September 19 (carrier), September 20 (hand). Secretary, J. McIntosh, 35, Russell Square, W.C.1.

THE BARN COMPETITION, promoted by Elliott and Sons, Ltd., manufacturers of Barnet plates and papers, closed on August 30, and has proved a very interesting competition. It has revealed a wonderful assortment of barns up and down the country, many quaint buildings, some picturesque and affording delightful studies, other historical and notable. The large entry showed that the idea was thoroughly appreciated. The standard of work was very good. The successful competitors were Walter North, 159, Portland Road, Hucknall, first prize, £5; R. W. T. Collins, Woodlyn, Shakespeare Road, Worthing, second prize, £3; J. Stewart, 60, Cromer Street Clifton, York, third prize, £1.

POLYTECHNIC PHOTOGRAPHIC SCHOOL.—We have just received a prospectus of evening classes which will be held at the Regent Street Polytechnic, London, W., during the coming season, commencing on September 29. There are classes on General Photography, Studio Portraiture, Black and White and Colour Finishing, Advertisement Figure Portraiture and Finishing, Retouching, Enlarging, Science for Photographers, Cinematography, Commercial Photography, and Catalogue Work, Tone and Three-colour Process Work. The classes in each subject are held from 7 to 9 p.m. Full particulars will be forwarded upon application to the Photographic School, and the teachers will be present on the evenings of the week September 22—26, from 6.30 to 9 p.m., to enrol and advise intending students. We may add that each subject is dealt with by a specialist with commercial experience in his particular branch.

PRACTICUS IN THE STUDIO.

[Previous articles of this series, in which the aim of the writer is to communicate items of a long experience in studio portraiture, have appeared weekly since the beginning of the present year. It is not thought possible to continue the series to the length of that by the same writer which ran through the "British Journal" some years ago, but if any reader among the younger generation of photographers, and particularly those engaged as assistants, has a particular subject which might be dealt with, his or her suggestion will be welcomed. The subjects of the previous articles of the series have been as follows:—

A Talk About Lighting (Jan. 3).
The Camera and the Lens (Jan. 10).
Managing the Sitter (Jan. 17).
Backgrounds (Jan. 24).
Studio Exposures (Jan. 31).
Artificial Lighting (Feb. 7).
Printing Processes for Portraiture (Feb. 14).
Studio Accessories and Furniture (Feb. 21).
The Surroundings of the Studio (Feb. 28).
Studio Heating and Ventilation (March 7).
The Postcard Studio (March 14).
The Printing-Room (March 21).
About the Reception Room (March 28).
Home Portraiture (April 4).
Portable Studios (April 11).
Copying (April 18).
Handling the Studio Camera (April 25).
More About Lenses (May 2).
Enlargements (May 9).
Advertising the Studio (May 16).
Mounts and Mounting (May 23).
Business Methods (May 30).
Photographing Children (June 6).
Portraits of Elderly People (June 13).
Something about Lenses (June 20).
Hand Cameras for Professionals (June 27).
The Dark-Room and Its Fittings (July 4).
Plates and Their Work (July 11).
Apparatus Repairs and Renovations (July 18).
Posing the Head (July 25).
Intensifying Portrait Negatives (Aug. 1).
Workshop Jobs (August 8).
The Personal Factor (Aug. 15).
The Keeping of Negatives (Aug. 22).
Reduction of Negatives and Prints (Aug. 29.)
Leaky Roofs (Sept. 5).
Blinds and Curtains (Sept. 12).

MINIATURES.

We generally find upon a photographer's card or letter paper the word "Miniatures," but in most cases these little pictures play a very small part as moneymakers in the business. This is, I think, largely due to insufficient thought being given to their production, and also to a lack of salesmanship on the part of the receptionist. Where a photographer "lays himself out" to produce miniatures of a high grade he usually finds it highly remunerative, and retains in his own hands business which is so often allowed to drift away to outsiders, by which I mean jewellers and fancy dealers who sell lockets, frames, and cases, and exhibit miniatures as a side line. As in many other branches of photography, it is a mistake to show very cheap work unless it is asked for, and in a studio of any pretensions the stock frame of gilt or rolled gold rims and pendants filled with roughly tinted P.O.P. or bromide prints should never appear, although they are, of course, quite in place in a working class district, or in places where the business consists mainly of postcards.

The miniature, properly so called, is a small water-colour painting direct upon ivory, and as such work calls for a high degree of artistic skill it is necessarily rather costly. There is, nevertheless, quite a good market for these, and I have taken many orders at prices ranging from five to twenty-five guineas for each picture, including a best-quality rim, or, if preferred, a leather case. If one is provided with a few good specimens it is easy to point out the superior transparency and purity of colour of a free-hand miniature, as compared with one on a photographic basis, and also to emphasise the ease with which alterations in dress, or even the features, can be made, while the undoubted permanency of the work is another good selling point. One common error must be avoided, and that is to endeavour to cheapen the production for the sake of extra profit. I have known unscrupulous photographers to offer the artist as little as two guineas for a painting for which the customer has paid ten. This is sheer profiteering, and in the end is bad business. I consider that the artist should receive at least half the selling price, leaving the balance to cover cost of mounting and profit.

To come to the photographic part of the business, the best class of miniatures are painted upon a faint carbon image supported upon ivory. These require less skilled artistic work, and any fairly good colourist can finish them, although a trained miniature painter will usually produce a more satisfactory result. The photographer, if a skilful carbon printer, can easily produce the plain print on ivory, but as a general rule it will be better and cheaper to give the job to a good firm of carbon printers. It is desirable to consult the artist as to the colour of the tissue to be used, as some prefer to work upon a warm toned basis, while others prefer a cold toned one. Sepia, standard brown, and warm black are the most useful colours. A little consideration should be given to the natural colouring of the subject in settling which should be used, as it is much easier to paint fair hair over a warm basis and dark hair over a colder one. As a fair price can be obtained, the greatest care in the selection of the colours used should be exercised, only those of undoubted permanency being employed. Books on miniature painting which deal fully with this question may be obtained for a shilling or so from most artists' colourmen.

A still cheaper class of work is produced in exactly the same way upon celluloid instead of ivory, but I do not recommend the use of this material, as the saving in cost is slight, perhaps half a crown on a two-inch picture, which is hardly worth considering unless the selling price is less than a couple of guineas. Naturally a cheaper quality of colouring is put upon this material.

For small framed pictures opal glass is often used as a basis for the photograph, but does not give the same effect as ivory or celluloid, and is better suited for C.D.V.s and larger sizes. It is very suitable for small highly finished monochromes on red chalk or sepia, and a few specimens in this style may bring orders from those who do not care for coloured pictures.

Before dealing with paper pictures, I must mention the Transferotype paper of Kodak, Ltd., which allows a bromide print to be transferred from its original support to ivory, celluloid or porcelain. As it in no way differs from an ordinary bromide image it is not comparable either in the matter of transparency of image or of permanence with carbon, but is nevertheless useful when these qualities are not in the highest degree essential. The process is very simple, being exactly similar to ordinary bromide printing up to the point of transferring, which is very simply done by soaking the finished print in water until it is limp, when it is squeegeed down upon the final support and placed under light pressure for about an hour. It is then immersed in water as warm as can comfortably be

borne by the hand, when the paper can be lifted off, leaving the film upon the support. A good rinsing in the warm water is given to remove the surplus gelatine substratum, and the process is complete. The image can be sepia-toned in the ordinary way before or after transferring. It must be remembered that the image is reversed in the transferring, so that if this be objectionable the print must be made by means of the camera or enlarging apparatus. I have found this very convenient when small prints are required from larger negatives, as the reduction and reversal can be made simultaneously by placing the glass side of the negative next to the lens. The paper is obtainable in the usual sizes at the same price as ordinary bromide paper, and full working instructions are given.

Very effective quasi-miniatures may be made by colouring platinotype prints with water colours. The effect is excellent, and they are, of course, quite permanent. I have one example which was produced over twenty years ago, which so far as I can see has not changed in the slightest degree, in spite of storage for some years in a very damp place, where ordinary P.O.P. and bromide prints had almost entirely faded away. Carbon prints can, of course, be treated in the same way, and are equally effective.

I would strongly advise that in all cases genuine artists' colours should be used in preference to dyes, even for the cheaper class of work. Some dyes are permanent, but there is no means of ascertaining which are, so that, except for the "eighteenpenny touch," they are best avoided. One has only to look at the specimens in the jewellers' windows to see how fugitive most of the colours are, especially the reds and pinks, and these, naturally, are the most important. Dyes which are fairly permanent when used alone often form fugitive mixtures. I well remember finishing a landscape with a mixture of dyes which gave exactly the brown colours I wanted. In three weeks it came back, a clump of brown trees having turned to a bright green!

Our miniatures should be fitted up in rims or frames in accordance with their value. In some few instances solid gold rims are ordered, but the majority of best quality rims are made by hand of fine copper, which is heavily gilded after being made; if carefully used these will retain their brilliancy for many years. They should be enclosed in a morocco snap case, lined with silk, and care should be taken that the colour of the lining does not detract from the picture. For this reason I always specify white or cream for light pictures, and very dark colours for dark ones. Dark green, blue, or brown may be used, whichever will best harmonise with the prevailing colour of the painting. The glasses must be absolutely colourless, as the slightest tinge of green is fatal to delicate colouring.

The fitting of an ivory picture into its rim is rather a delicate operation if it has to be cut into an oval or circle, as it is very easy to split the ivory by cutting against the grain. Supposing that we have an oblong ivory to cut into an oval rim, we must take a small sharp pair of scissors and commence by cutting from the middle of the right hand side round the edge of the oval to the top; the margin will probably split off in pieces. We then turn the ivory over so that we are looking at the back. This brings the other top corner into position for cutting, which we do in the same way, the two cuts meeting at the top. The two bottom corners are cut by turning the picture upside down and proceeding in the same way. It is worth practising this on a piece of plain ivory before risking a valuable painting.

Enamel miniatures, those which are burnt in upon copper or porcelain, are, of course, beyond the powers of most photographers, and must be placed in the hands of a firm which specialises in this class of work. Unless the enameller also supplies the rim, it is advisable that this should not be ordered until the picture is delivered so as to ensure a proper fit, as such pictures can only be cut with great risk of damage.

Miniatures are sometimes required on watch dials or inside the cases or domes. They may be either ordinary coloured carbon prints or enamels, but in either case the portion which is to receive the print should be detached by a watchmaker to avoid damaging the works. Carbon prints transferred to matt-surface silver look very well, but gold should either be silver-plated or given a coat of white enamel similar to that on the dial. The carbon image can then be put on by the ordinary double transfer process, a preliminary substratum of insoluble gelatine being necessary. A coating of celluloid varnish or amber dissolved in chloroform is advisable to protect the gelatine as no glass covering is possible. Enamels require no protection.

PRACTICUS.

SULPHIDE TONING WITH POLYSULPHIDE.

In the current issue of the "Bulletin of the French Photographic Society" M. L. P. Clerc has a note on the process of sepia toning with polysulphide, originated some years ago by M. Desalme, a translation of whose communication appeared at the time in the "British Journal" of February 28, 1913, p. 157. M. Desalme's method consisted in making a solution of polysulphide by boiling sulphur with strong solution of ordinary sodium sulphide, or by mixing a strong solution of sodium sulphide with hydrogen peroxide. The yellow solution produced in each case is largely diluted with water to form the toning bath, in which prints gradually tone from a black to a warm sepia ground in about thirty minutes.

M. Clerc has found that the process does not work with the same readiness in the case of all papers, and that certain brands refuse to tone at all. The simplicity and cheapness of the process and the excellent results obtained under suitable conditions have therefore prompted him to make tests of a number of prints which showed no toning action after an hour's immersion in the bath with the object of discovering the cause of their failure to tone.

In order to test the condition of the image of a print which had thus remained untoned in the polysulphide bath, a print was well washed and treated with Farmer's reducer. The image was slightly reduced at the same time, becoming, almost instantaneously, of sepia tone. It thus seemed that the particles of reduced silver were attacked superficially in the hypo-ferricyanide bath, a layer of black metallic silver being removed from the nucleus of brown silver sulphide, and disclosing the toning already partly completed. In these conditions it appeared probable that toning would take place by prolonging the time of immersion of the prints in the polysulphide bath for a sufficient time.

The strength of the solution appeared to have no influence either on the time of toning or the colour of the prints. The only practical means for increasing the speed of toning thus appeared to be the use of a higher temperature. Prints which had been toned for one hour without having exhibited any change were hardened, with other untoned prints, in weak solution of formaline, and then immersed in solutions of polysulphide at various temperatures. Toning was found to take place more rapidly according to the temperature of the bath. At a temperature of about 120 deg. F. toning was complete in ten minutes, but the tone was no longer sepia brown, as when toning in the cold, but purplish brown, resembling the tone obtained by hot hypo-alum.

Other prints which refused to tone in the cold within a reasonable time were kept in the polysulphide solution for a longer period than two hours. With two hours' immersion at a temperature of about 60 deg. F. the prints became warm black; after three hours some of them toned to a very pleasant purplish brown, whilst others took six hours to tone to sepia brown.

The same process of toning is applicable to glass transparencies, the toned images being much more transparent than before toning. In testing the action of the bath on transparencies made on different brands of plate, the same differences are met with as among papers. Some transparencies tone rapidly whilst others are difficult to tone, and show an alteration of colour only after several hours' treatment. Still others obstinately refuse to tone even after very prolonged immersion in a heated bath.

The differences here noted by M. Clerc conform fairly closely to those which are found in the case of the toning of bromide papers with liver of sulphur. It is no doubt common knowledge that some

bromide papers tone very readily by this method and yield excellent results, whilst prints on other papers seem almost untonable in a "liver" bath, although both descriptions of paper will tone with equal readiness both by the bleach and sulphide method and by hypo-alum.

Assistants' Notes.

Notes by assistants suitable for this column will be considered and paid for on the first of the month following publication.

Labelling Bottles.

The usual paper label, as all are aware, is rather a delusion and a snare, owing to a tendency to drop off, and perhaps is swept up unnoticed, often leaving one in a state of doubt as to the contents of its divorced companion.

A plan which has been found good consists in using very thick gum to which a few drops of a saturated solution of potassium bichromate have been added, just sufficient to turn the gum orange. The mixture will not keep. On exposure to light the gum is rendered insoluble, or partially so. When dry, the label, which should be of good quality paper, is coated with celluloid varnish, working it a little above the label. Labels so affixed have remained *in situ* for years, though continually exposed to damp. They have also withstood occasional rinses under the tap to remove attached crystals due to solutions trickling down the bottles after pouring.

A label which never drops off is made by applying lettering in anti-sulphuric paint direct to the glass. It will withstand nearly all chemicals, is unaffected by water, and adheres with tenacity, being vastly superior in these respects to ordinary paint, Berlin black, shellac varnish compounds, etc. Capital also for making plainly visible the numbers and graduations of clear-glass measures, frequently difficult to read in the dark-room. The anti-sulphuric paint or varnish is supplied in black and red by electrical houses, and although expensive, a little goes a long way. It has many useful photographic applications—touching up old *papier maché* dishes, rendering wood waterproof, painting metal plate-washers, and the like. It dries rather slowly, and should not be applied in thick coats, and care must be taken that no tears form, as these take a long time to set.—Chloride.

Photo-Mechanical Notes.

Avoiding Moire Pattern.

Nothing is so annoying to the half-tone engraver as the unpleasant pattern that is bound to occur when the lines of a copy meet the lines of the screen at too narrow an angle. The first thing the operator does is to twist the original, or revolve his screen until he gets the least obvious pattern, and sometimes this is all that is necessary to do to cause it to entirely disappear. But some subjects are not amenable to this treatment; for example, in a subject having circular lines the pattern is bound to occur no matter how you turn original or screen. An irregular grain screen is a good solution of the problem, but sometimes the customer objects to an irregular grain, and frequently the engraver has not a suitable irregular grain screen. In the case of the circular lines, after the half-tone is made it can be tooled by the engraver to make the pattern almost disappear. Another instance of the pattern being dodged very neatly is that of the engraver who had to reproduce some steel engravings. He twisted them until the pattern was at its minimum, and was at only one spot. This position was carefully marked, the original was then lightly air-brushed so that the lines were just obliterated, of course keeping the tone of the subject the same. Then the engraving was made, and the hand engraver imitated the lines of the original on the patch which had been air-brushed and reproduced as an even tone, thus very successfully avoiding the uncomfortable moiré pattern.

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Applications, Sept. 1 to 6.

Cinematography.—No. 21,987. Cinematograph apparatus. A. S. Newman.

Cinematography.—No. 21,780. Spools for cinematograph films. R. Rigby.

Projection Lantern.—No. 21,507. Projection lantern for advertising. C. E. Dyte.

Projection Screens.—No. 21,452. Daylight cinematograph screens. W. J. Marks.

COMPLETE SPECIFICATIONS ACCEPTED.

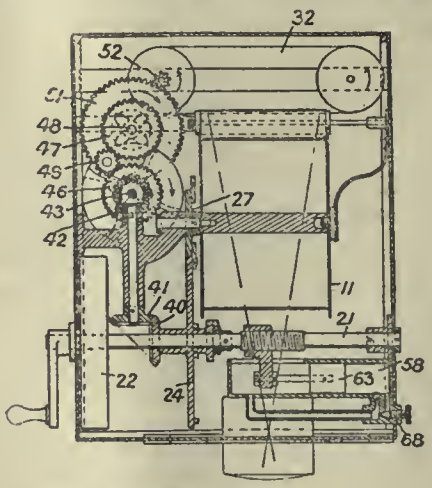
These specifications are obtainable, price 6d. each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

Roll-Film Cameras.—No. 128,637 (August 20, 1917). The invention relates to an automatic roll-film camera for taking pictures of successive portions of an object or landscape from a moving vehicle, such as an aeroplane. The drawing shows a transverse vertical section. The shutter 32 consists of an endless curtain having two apertures and moved intermittently transversely of the film, which passes between the upper and lower portions of the shutter.

The take-up spool 11 is of such a size that each lap of film around its core will constitute an integral number of pictures or a single picture, and is provided with one or more notches to indicate where the film should be cut to sever the separate pictures.

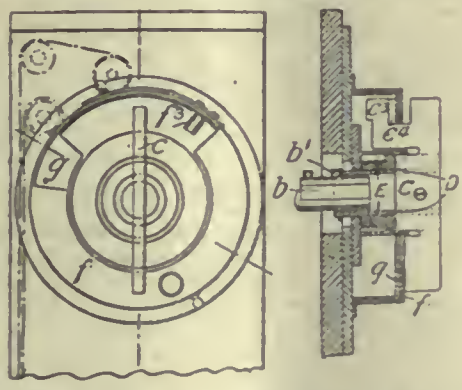
The shutter and film are alternately moved by continuous rotation of a shaft 21 from a spring 22. This shaft carries a mutilated



gear-wheel 24 engaging with a mutilated pinion 27 on the spindle of the take-up spool; it also operates bevel-gear 40 . . 43 and spur gear 46, 49, 47, the wheel 47 being loosely mounted on a shaft 48 which is intermittently rotated by a spring wound up by the wheel 47 which movement is transmitted to the shutter by gear 51, 52. The movement is regulated by a dash-pot comprising a piston 63 operated by screw-and-nut gear and working in a cylinder 58. The operation of the camera may be stopped by screwing down a needle valve 68. H. G. C. Fairweather, 65, Chancery Lane, for G.E.M. Engineering Co., 1,216, Walnut Street, Philadelphia, U.S.A.

Focal-Plane Shutters.—No. 129,037 (October 2, 1917). The invention relates to focal-plane shutters such as those described in Patent No. 6,258. 1912 (B.J., April 25, 1913). Means are provided for holding the winding-handle C in gear during the setting

of the shutter, and for holding it out of gear at other times. When the handle C is rotated, a bevelled surface c^4 on a shoulder c^3 comes into contact with one end of a slot formed in flanges *f*, *g*, and the handle is thus forced inwards against the action of



a spring E until a clutch member on the end of a sleeve D engages a pin b^1 on the shaft *b* of the setting-mechanism, and the shoulder continues to travel under the flange until it engages a stop f^3. The flange *g* is rotatable relatively to the flange *f* to vary the size of the slot. Thornton-Pickard Manufacturing Co., A. G. Pickard and F. Slinger, all of Altrincham, Cheshire.

Flash Lamps.—No. 122,719 (February 12, 1918). The invention consists in a device for producing flashes by the electric volatilisation of fusible wires, for instance of aluminium, copper, or magnesium. It comprises an insulating support with eyelets for attachment of the wires, another support for conductive plugs engaging the eyelets, and a current distributor allowing a variable number of wires to be volatilised at each operation. In one arrangement, the wires C, Fig. 4, connect a circular row of eyelets B in a cardboard disc A to a central eyelet. Plugs E, which may be spring-urged, are mounted on an insulating base D and enter the outer eyelets B, while a pin G inserted through a central eyelet into a

Fig. 4.

socket H in the base presses the disc A towards the base. The socket H is directly attached to one conductor, and the plugs E are connected to a row of contacts M, Fig. 5, on a plate I. A switch arm J carrying a brush N is held by a catch P, which can be disengaged by a Bowden wire U. A spring L then rotates the switch arm, which sweeps over the contacts M until a stud T on the switch arm meets a stop arm Q, retained in the desired position by a pin R inserted in one of a number of holes S. In another arrangement, the wires are in series between eyelets *b*, Fig. 9, in a flexible band *a*, which in being wound off a drum W on to a drum W^1 passes over a wheel *i* carrying studs *e*. These studs engage the eyelets and are attached to contacts *m* successively engaging a pair of brushes *n*, n^1. A pinion X on the wheel *i* gears with a toothed wheel Y which is driven by a spring *l* wound by a chain *o* and connected to the wheel Y by a ratchet-wheel and pawl v^1. A catch y^{11} acting on the ratchet-wheel can be withdrawn electro-magnetically.

The amount of rotation and consequently the number of wires volatilised is determined by one or other of two wheels Z, Z^{11} geared to the ratchet-wheel, the wheel Z rotating more slowly and the wheel Z^{11} rotating more quickly than the ratchet-wheel. A pin *t* or t^1 on either wheel is arrested after the required movement by an arm *q* or q^1 secured by a pin *r* or r^1 entering holes in an arc V or V^1. The arm *q* or q^1 not in use is folded up out of the way about a hinge *z* or z^1. A fixed stop arrests the pin *t* in zero position when the spring is wound up.

To use more wires than allowed by the wheel Z, both arms are thrown out of action; still more wires can be burnt by turning the drum W^1 by hand. In another arrangement, the contact wheel

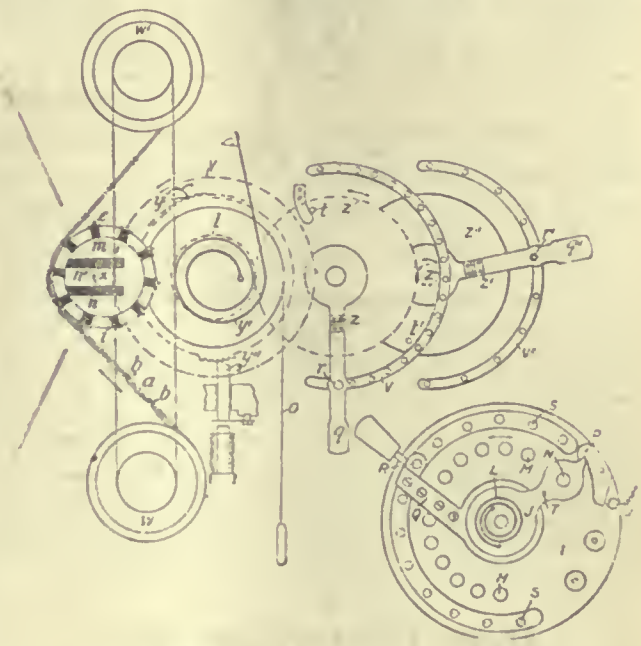


Fig. 9. Fig. 5.

is driven by a belt from a crank-actuated shaft on which is a cam periodically closing a switch connected to the brushes. In another arrangement, the wires are transversely or diagonally arranged on the band, and the pairs of eyelets are engaged by studs on a drum having on its ends contacts connected to the studs. A further modification consists in winding the wire continuously around an asbestos or like band and attaching it at intervals to eyelets. —J. and P. Courtier, 20, Rue Ernest Cresson, Paris.

New Books.

Kelly's Directory of the Chemical Industries, 1919.—The expansion of chemical industry in this country is marked by the larger size of the latest edition of the directory of the trades just issued by Messrs. Kelly's Directories, Ltd., 182, High Holborn, London, W.C.1, which runs to nearly 880 pages, as compared with 809 pages of the previous edition, issued in 1916. Part of the increase is, however, due to rearrangement of sections. The compilation is chiefly of interest to those in the photographic trade, or to anyone having dealings with photographers and photographic dealers, from the information it gives on the distribution of these two classes of traders. In the classification of trades and professions, divided into two sections, namely, London and Provinces, photographers and photographic material dealers are among the largest lists. The earlier portion of the book consists of an alphabetical arrangement of places under the counties of England, Scotland, and Ireland, and thus shows the name of a photographer or photographic dealer in a given town. As we have pointed out in the case of previous editions, the particulars given of manufacturers of dry-plates, printing papers, photographic apparatus, and photographic chemicals are wanting in accuracy, chiefly as the result of insufficient discrimination between actual manufacturers and merchants; and in one or two cases we notice makers of sensitive materials figuring rather strangely as manufacturers of apparatus. These, however, are minor defects, which are almost immaterial in their effect upon the great usefulness of a very valuable compilation.

Stereoscopic Photography.—For some years past there has not been a text-book of stereoscopic photography in print. The want has been remedied by the publication of No. 175 of the "Photo

Miniature," just issued in this country by Messrs. Houghtons, Ltd., 88-89, High Holborn, London, W.C.1, and in America by the publishers, Messrs. Tennant and Ward, 103, Park Avenue, New York. It is a comprehensive and brightly-written little manual, which touches sufficiently upon the historical details of binocular vision and stereoscopic photography, and deals at length with the practical methods of the latter of the ordinary kind, and also of such special applications as the making of X-ray stereograms and of stereoscopic colour transparencies on the Autochrome and Paget plates. The manual may be commended to the amateur photographic worker as an excellent guide in these branches of work.

CHEMICAL REAGENTS.—A re-edition of the work by Dr. C. Krauch, chemist to the firm of E. Merck, has been issued by Messrs. Scott, Greenwood and Son, 8, Broadway, Ludgate Hill, E.C.4, in the form of a revised and enlarged translation by H. B. Stocks, F.I.C. This is a translation from the third German edition, and very largely extends and supplements the first English edition published seventeen years ago. The arrangement throughout is alphabetical, but the text is rendered still further accessible by the inclusion of an excellent index. In the case of each chemical reagent indications are given of the commonly occuring impurities, together with specific tests for their detection. In each case also the paragraph mentions the uses of the reagents, and in doing so cites abundant references to original papers in chemical literature. The translator has rendered a very great service to the English reader by making these references, whenever possible, to English chemical journals in which the same matter has appeared. The book, which has long been a standard treatise on its subject, is one which is invaluable to the experimental chemist. Its price is 17s. 6d.

New Materials, &c.

Metol-Griffins and Amidol-Griffins. Sold by John J. Griffin and Sons, Ltd., Kingsway, London, W.C.2.

METOL and amidol of British manufacture are two new introductions of Messrs. Griffins which will be found to deserve the good opinion attaching to these popular developers. Made up according to the customary formula of sulphite and a little bromide the amidol yields prints of the brilliance and fine black colour characteristic of this developer. The metol, employed in an ordinary developing formula in conjunction with hydroquinone shows itself as possessing the qualities which have brought this combination into universal use for both plates and prints. Although the developers are not as free from colour as other products, yet the difference appears to have no effect upon their developing properties. They are sold at the following prices:—Metol 72s. per lb., 4s. 6d. per oz; amidol 32s. per lb., 2s. per oz.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

TUESDAY, SEPTEMBER 23.

Hackney Photographic Society. Print Competition: Pictures, including a portion of St. Paul's.

THURSDAY, SEPTEMBER 25.

Hammersmith (Hampshire House) Photographic Society. "Egypt." A. Keighley.

CROYDON CAMERA CLUB.

MR. J. W. PURKIS gave another contribution to the informal session with an elaborate exposition on copying appliances of the "Hectograph" order, a most useful contribution for secretaries and all who have to do manifolding. He gave various formulas and tips, of which only those found best need be recorded.

The best formula for the jelly, which possesses advantages over the commercial article, he had found to be as follows:—

Leaf gelatine	1 part by weight.
Water	5 parts by measure.
Golden syrup	8 parts by ,,
Carbolic acid, 10 per cent. solution ..	1-16 part by ,,

Break the leaf gelatine into small pieces, and soak in the water for about 30 minutes. Heat in a water bath till dissolved; add the golden syrup and preservative; filter through fabric into a shallow dish, and skim off scum with the edge of a piece of clean paper. For a 10 x 8 dish about 2¼ ozs. of the gelatine, and other ingredients in proportion, will be about right. If to be consumed as a jujube, omit the carbolic. In either case, use when set.

The ordinary commercial graph inks answer well. For home-made ones he had no formula, adding to a saturated solution of methyl violet sufficient sugar to make the ink flow easily. Fountain and stylo pens may be employed with fair success, but being designed for thin inks do not respond kindly to thick. Specially designed pens for thick inks might be made. With a stylo, enlarging the hole and reducing the diameter of the pin would do all that was necessary.

Copying-pencils are effective, but only applicable to "Hectograph" flexible gelatined copying sheets. He had tried many pencils with varying success, and could recommend the "Eagle Manifold" which renders 50 legible copies. A rough paper for the original is necessary. Better, a non-absorbent material such as acid etched ground-glass. "How would a carpenter's rasp do?" enquired Mr. Sellors. "Too severe," said the demonstrator. Care must be taken to secure good contact all over the surface of the jelly. He left the ground-glass in contact for 15 minutes and upwards. Possibly a shorter time would answer, but as the secretary had advanced his demonstration a fortnight he had not had time to try.

He then gave a practical demonstration of the making of the jelly, using an ingenious water bath consisting of a saucepan containing a jam pot supported on fireclay tops of worn-out inverted incandescent gas burners, capital appliances for the purpose. It was noticed that as he poured the Lyles syrup it seemed strangely thin, and this was pointed out "Quite true," he said, "but for the purpose of this demonstration I had to add water to eke out the stuff, for I dared not sneak another tin." "Married, of course," remarked the "office boy" in pitying accents. A most hearty vote of thanks was accorded Mr. Purkis for a very complete demonstration.

During the evening the secretary, Mr. Sellors, announced that he was going to indulge in a month's holiday. The assistant secretary (otherwise the "office boy") would act in his absence. Any incivility or inattention should be immediately reported.

Commercial & Legal Intelligence.

PHOTOGRAPHIC ENTERPRISES.—At the London Bankruptcy Court last week, before Mr. Registrar Francke, the public examination was held of Frank Soward, 32, Coniston Road, Muswell Hill.

According to the debtor's amended statement of affairs the gross liabilities were estimated at £819 13s. 1d., of which £660 13s. 1d. was expected to rank against the estate for dividend, and assets nil, thus showing a deficiency of £660 13s. 1d.

In reply to questions put by the Official Receiver, debtor stated that he was introduced to a certain person, who told him there was a good thing going in "Colourgraphs, Ltd." Debtor and several friends, in about December, 1917, purchased 600 or 700 shares at par, of which debtor had fifty. Their informant was introduced to debtor as manager of Colourgraphs, Ltd., and he suggested promoting a new company to be styled Photocol, Ltd., for the purpose of taking over the assets and undertaking of the old company, obtaining capital for the working of the secret process it held relating to the enlargement and colouring of photographs, and the securing of premises at Thornton Heath. Debtor was asked if he could find some capital for these objects. He approached three of his friends, and they found £400, which debtor paid to his informant with moneys of his own. Altogether debtor had paid in this way about £1,100. Debtor was to receive 1,000 fully paid shares of £1 each in Photocol, Ltd. No part of the advances made by debtor to the payee had been repaid, neither has he received any shares in Photocol, Ltd., which company is still in existence and did not recognise the payee. Debtor estimates his loss in connection with this venture at £1,100, less the value of 1,500 shares in Colourgraphs, Ltd., valued at £150.

Debtor now submitted a proposal for the payment of a composition of 5s. in the £ to his creditors.

The examination was concluded.

Correspondence.

**** Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

**** We do not undertake responsibility for the opinions expressed by our correspondents.*

EYEGLASS FOCUSSING MAGNIFIERS.

To the Editors.

Gentlemen,—Will "Bi-focal" please explain how he gets binocular vision with a pair of eyeglasses fitted with magnifying lenses to fit the wearer's sight. Any magnifier with a longer focus than 3 ins. is hardly worth while. If such eyeglasses working at this distance could be made to give binocular vision it would be a blessing in many ways. Probably their least use would be in focussing, for binocular vision is not necessary for this purpose. If both hands must be free, what is the matter with a watchmaker's eyeglass? It is cheap, and when a ground-glass screen is used nothing more is necessary.

May I remind him that the inventor of bi-focal died 130 years ago?—Yours truly, TRAVERS J. BRIANT.

Beverley, Epsom, Sept. 14, 1919

Gentlemen,—I read "Bi-focal" to-day with interest. Focussing is my trouble. I use the usual form which touches the ground glass, and have fitted a spectacle glass on top and take off my two-lens spectacles. With the lower glass I can easily read and write, but not focus with them on a ground glass. Hence the magnifier, which is only of local use, and I often find a falling off in other parts.

I can see it is possible that the same power of this focussing lens can be fitted into the lower half of a spectacle frame. If so, why have I and hundreds of others getting into old age been working with this one-eye difficulty, when two could be had, and the means provided of a quicker and general all-over survey which you feel the want of when focussing in portraiture. Do you consider this so-called Franklin lens is possible, and are they reasonable in price, and where should one go?—Yours, etc., T. C.

In answer to the above "Bi-focal" writes:—I find the bottom lenses of my bi-focal eyeglasses are something under 3-in. focus, but they are getting a little too long, and I must have a new pair fitted of shorter focus. It may not be quite correct to call them magnifiers, but they have proved very useful for ten years or more, if occasionally changed for a stronger pair, and enable me to focus in comfort, and if I require more magnifying power I can use the ordinary eye-piece magnifier. Will Mr. Travers J. Briant kindly explain how I am to fix a watchmaker's eyeglass on my eye when I already wear eyeglasses for astigmatism?

It is those who, like myself, are getting into the "sere and yellow" that will, I think, find my suggestion of value. Those who are fortunate enough still to possess the youthful power of "accommodation" can afford to despise it. The date of the death of the inventor of bi-focals does not interest me, although I am grateful to him for his invention.

"T. C." will find the bi-focal lenses of shorter focus quite reasonable in price, to be obtained of any good optician, and he need only explain the purpose for which they are required.

AN AEROPLANE WORKS CAMERA CLUB.—A photographic society, to be known as the British and Colonial Camera Club, has been established by the staff of the British and Colonial Aeroplane Company, Ltd., Filton, Bristol, and has its own little organ in the magazine, "The Bristol 'Bullet'-in," issued by and for the employees of the firm. The president of the club is Mr. T. Temple Robins and the secretary Mr. F. Broad, whose address is c.o. The British and Colonial Aeroplane Company.

Answers to Correspondents.

SPECIAL NOTICE.

In consequence of general reduced supplies of paper, as the result of prohibition of the importation of much wood pulp and grass, a smaller space will be available until further notice for replies to correspondents.

Moreover, we will answer by post if stamped and addressed envelope is enclosed for reply: 5-cent. International Coupon, from readers abroad.

The full questions and answers will be printed only in the case of inquiries of general interest.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

E. B.—Generally speaking, we are of opinion that prints toned with liver of sulphur are not altogether as permanent as those treated by the customary bleach and sulphide baths. With liver, according to any formula, you tone only part of the silver image, whereas by the double bath process you convert the lot into silver sulphide, which is a highly permanent compound.

C. N.—Autochrome plates can be got by putting your name on a waiting list. We believe the Paget plates can be supplied. Sulphuric acid is by no means as good a preservative of pyro as metabisulphite, but there is no other disadvantage in using it, except that if it is used in any considerable proportion allowance must be made for its neutralising the alkaline solution of the developer.

C. S.—Individuals suffer as the result of being unduly sensitive, and developer which will be quite innocuous to one person is virulent in its effects upon another. The only developer for bromide papers which is quite free from these dangers is ferrous oxalate, the old iron developer. Used with due observance of the washing in weak acid between development and fixing, it is absolutely as fine a developer as there is for bromide paper.

A. AND A.—The only book on the iron printing photo-copying processes, which is now in print, is "Photographic Reproduction Processes," by P. Duchochois, published by Messrs. Hampton and Co., Cursitor Street, London, E.C., price 2s. 6d. Another manual, "Ferric and Heliographic Processes," has been out of print for some years, but perhaps might be bought from dealers in second-hand books, such as Messrs. W. and G. Foyle, 121-123, Charing Cross Road, London, W.C.2.

W. M. H.—We are sorry we cannot identify the extra-rapid rectilinear from the lists we have of Messrs. Taylor, Taylor, and Hobson. At a guess we should say the present second-hand value is about £2, but we should think it would be worth while to send particulars to Messrs. Taylor, Taylor, and Hobson and ask them for the original list price. If the lens is still in first-rate condition and covers the plate for which it is listed, you could perhaps get half the original list price for it from a direct purchaser.

F. A.—You should send a formal invoice for the reproduction rights in the two photographs at the end of the month. The usual charge is 10s. 6d. per subject, although 15s. is now being very commonly paid as the minimum reproduction fee. If they don't pay you within a reasonable time we should write them a pleasant letter pointing out that there has been no offer to them of the photographs gratuitously, and that as the copyright is yours, any refusal to pay for the reproductions must be regarded as an act of wilful infringement.

D. D.—The customary operations of making photo-litho transfers are by no means beyond the skill of a photographer. You can get a reasonably good insight into them from the book "Photo-Mechanical Processes," by W. T. Wilkinson, price 4s., from Messrs. Hamptons, Cursitor Street, London, E.C., which deals

also with photogravure. If you are thinking of working either of the processes it would be to your advantage to have a course of technical instruction, best at the L.C.C. School of Photo-Engraving, Bolt Court, Fleet Street, London, E.C.

C. H. M.—Either of the shades sent will be quite suitable for the dark blinds, but we should prefer the colder tint. As you are having glass on both sides of the roof, one side will be exposed to the direct sun during the greater part of the day, and we are afraid that you will get a hot-coloured glare through the light brown. With regard to the lens, we think you will do well to get the *f*/6 portrait or anastigmat lens. We have had considerable experience with both types, and there is not much to choose between them, except that the former is a good deal cheaper and some makes have the diffusion arrangement.

T. C. T.—1. From sixteen to twenty incandescent burners are used under the best conditions to allow of exposures of about four to five seconds with an *f*/4 lens and ultra rapid plate. 2. Usually a single thickness of muslin is the most that can be used. You cannot afford to cut down the light much. Owing to the area of the system of burners it is often quite possible to dispense with the diffusing screen. 3. Within limits decent work can be done, but unless the place is of fair size and well ventilated, a gas lamp makes it insufferably hot. There are two gas installations on the market, the "Powerful" of the Kodak Company, Kingsway, W.C., and the "Howellite" of Messrs. Griffin and Son, Ltd., Kingsway, W.C.

H. M. B.—Reversed film negatives are by no means uncommon, although we have never seen such a good specimen of a positive "negative" as the one you send. One cause which we think is perhaps the most common is development of the roll-film in a dark-room illumination which can affect the emulsion. It can happen that a negative image is developed on the surface of the film, and if this latter is held close to the dark-room light to look at it a positive may be printed upon the lower part of the emulsion sufficiently vigorous to mask the overlying negative. Apparently there are other causes than this, but these are obscure. Personally we do not think that the specimen you send is caused by the process we have described.

A. M.—1. You require to apply to the Regional Branch of the Retail Businesses Licensing Order. There are eleven of these in different parts of the country. As you do not tell us where you intend to start the business, the best we can advise you is to be guided by the list recently published. 2. It should not take more than four or five weeks, but, of course, we have heard of cases in which there has been great delay. 3. If you do not trade in your own name you must register. For the necessary forms apply to the Registrar of Business Names, 39, Russell Square, London, W.C.1. 4. Under the Business Names Act you must put your own name on your trade stationery as well as your trade name, but there is no need to have it on showcases or the facia of premises.

G. C. B.—1. A film filter is quite satisfactory for panchromatic and orthochromatic work. It is usually placed next to the lens diaphragm. So long as you lay it there flat and keep it from getting crinkled by damp it will last a very long time. 2. No, the more bromide you use in a gaslight or bromide developer the more the colour varies from a good black. You want to use only just enough bromide to preserve the purity of the whites, that is prevent veil. 3. If the plates are really thoroughly fixed, no harm will result by washing for only five minutes, drying, and then washing again a week later. 4. We do not know the cause, although the defect is by no means uncommon. Usually prints can be made to bleach uniformly all over by adding a little ammonia to the bleaching bath.

J. G.—1. You could not depend on re-fixing and washing being of any good for preventing the yellowing and fading. The most common cause is insufficient fixing in the first instance, and if prints have been once washed and dried whilst imperfectly fixed it is no good trying to remedy them by re-fixing. In one case out of perhaps two or three hundred it might work, but in the majority it would not. 2. You can deposit a thin film of magnesia by burning a little magnesium ribbon, but a better plan is to fill the cup with ice-cold water and to photograph it when just a light deposit of dew on the outside has dulled the polish. The best plan of all is to shield the cup from things which can be reflected in it by making a kind of small, open-ended, tent of muslin, in which the cup is placed. You will find a good many hints on photographing articles of this kind in "Commercial Photography," which our publishers issue, price 1s. 2d., post free.

J. S.—Perhaps you could learn the carbon process by yourself from the text-book of the Autotype Company, but if you can manage it it would be very much better to go through the course of instruction in the process which the Autotype Company offer free at their works. In either case you had better write to them at 74, New Oxford Street, London, W.C.1. If you want to make small negatives from your half-plate and postcard negative you must rig up the latter against an even light and photograph them down as positives, next printing negatives therefrom; or you can make good prints on semi-glossy paper from the negatives and photograph these together, so that you get a number of the small negatives on one plate. This latter is the more usual plan. There is no book on making these coloured miniatures. Usually they are circle bromide prints, which are celluloid-faced by being dipped in spirit and then hot rolled with thin celluloid. You can get, or could get, the hot roller from Messrs. Fallowfield, 146, Charing Cross Road, London, W.C.2; the celluloid from Messrs. Rheinlander and Son, Rodney Road, New Malden, Surrey, who also supply a cement which dispenses with the hot rolling.

A. G.—1. Yes, and will retain its activity if kept in the dark. 2. For the best results you should dissolve the sulphite the same day as you use the developer, although certainly amidol can be added to sulphite solution which has been kept four or five days. 3. A blackened tube will make a very good lens hood. You can find out how long it should be only by trial. Make a tube first of stiff paper, and then, by removing the focussing screen, look through the back of the camera from positions corresponding with each corner of the plate. If you can see part of the lens at full aperture being "cut off" by the projecting tube it is a sign that you must reduce the length of the tube until there is no cut-off. 4. We think the confusion as to bromide is not of the principle of its action, but simply as to the manner of use. If a plate has been over-exposed and is put in a developer without an extra dose of bromide it soon darkens over, and the worker, thinking it is fogging hopelessly, takes it out and gets a thin negative simply because development has been for too short a time. If, however, bromide is added the bromide reduces the fogging power of the developer and enables the plate to be kept in the developer for a sufficient time for ample density to be obtained without undue fog.

The British Journal of Photography.

The Oldest Photographic Journal in the World.

PUBLISHED EVERY FRIDAY. ESTABLISHED 1854. **PRICE TWOPENCE**

TERMS OF SUBSCRIPTION, POST FREE.

UNITED KINGDOM.—One Year, 10s. 10d.; Six Months, 5s. 5d. Three Months, 2s. 9d.

CANADA ... ...
AUSTRALIA ... ...
NEW ZEALAND ... ...
SOUTH AFRICA ... ...
UNITED STATES OF AMERICA
SOUTH AMERICA ... ...
INDIA AND FAR EAST ... ...
CONTINENT OF EUROPE ...

One Year. Thirteen shillings (13s.), or 3 dollars 17 cents, or 22 francs, or 9 rupees 12 annas, or 6 yens 30 sens.

FEDERATED MALAY STATES, BORNEO AND SARAWAK 5 dollars 57 cents.

HENRY GREENWOOD & CO., LTD., Proprietors and Publishers, 24, Wellington Street, London, W.C.2.

IMPORTANT NOTICE TO READERS.—Until further notice agents will supply the "B. J." to order only, as the high price prevailing for everything in connection with newspaper production prohibit the distribution of surplus copies for chance sales. It is therefore necessary in order to ensure the regular delivery of the "B. J." each week to place an order definitely with a dealer, newsagent or bookstall clerk, or to send a subscription to the publishers.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3099. Vol. LXVI. FRIDAY, SEPTEMBER 26, 1919. Price Twopence.

Contents.

	Page
Ex-Cathedra	557
Some Critics on "Likeness" in Portraits	558
Practicus in the Studio. By Practicus	559
Some Personal Impressions of the London Salon. By F. C. Tilney	560
The Production of Perfect Sepias. By Thermit	563
A Device to Facilitate the Cutting of Plates for Small Cameras. By Vivian Jobling	564
Photo-Mechanical Notes	565
Patent News	566
Meetings of Societies	567
Commercial and Legal Intelligence	568
News and Notes	568
Correspondence—	
Natural Colour Photography—Eyeglass Focussing Magnifiers	569
A Common Cause of Loss of Business — Amateurs' Film Spools — The "Croydon" Hectograph — Photographers and the Sale of Postcards	570
Selective Reduction with Bichromate	571
Answers to Correspondents	571

SUMMARY.

In the course of an article recording some personal impressions of the exhibition of the London Salon, Mr. F. C. Tilney points out the difference in artistic method which he discerns between the sophisticated European workers and those from overseas, whose outlook on Nature is almost always fresher and more direct. (P. 560.)

In his article this week "Practicus" deals with the great variety offered to the present-day photographer in printing papers as regards surface texture and colour of the base and equally colour and tonal quality of the photographic image. (P. 559.)

In a leading article reference is made to some of the views which have been expressed of "likeness" in portraits by recognised critics of paintings. (P. 558.)

We regret to announce the sudden death on Monday last of Mr. G. A. Pickard, head of the Thornton-Pickard Manufacturing Company. (P. 565.)

Summer time ends at 2 a.m. on Monday next, September 29. (P. 568.)

Some practical hints on the testing of lenses for process and copying work are contributed to "Photo-Mechanical Notes" by Mr. Kenneth Hunter. (P. 565.)

A contributed article deals with the various defects which may arise in the making of sepia prints by toning with hypo-alum or by the bleach-and-sulphide method. (P. 563.)

Working details and illustrative diagrams of a method of selective reduction with bichromate are given by a correspondent. (P. 571.)

Mr. Vivian Jobling describes, with illustrations, how to make a gauge for cutting 4½ by 6 cm. plates from 5 by 4 or postcards. (P. 564.)

A system of daylight development of plates or films carried in envelopes is among the Patents of the Week. (P. 566.)

The Retail Businesses Licensing Order, permanence of prints, backing plates, half-watt lighting, and lenses for enlarging are among the subjects of brief replies to correspondents. (P. 571.)

In using a large enlarging lantern of the condenser pattern it is an advantage to have a smaller condenser for dealing with small negatives or alternatively to fit the enlarger with a movement by which the negative can be placed at any required distance from the condenser. (P. 557.)

Brushwork on prints is a form of working-up the advantages of which seem to be somewhat neglected. (P. 558.)

The introduction of ordinary lantern slides into cinematograph exhibitions will, it is hoped, provide a stimulus to the revival of artistically coloured slides. (P. 557.)

EX CATHEDRA.

Mixed Lantern Shows. The interesting entertainment "With Allenby in Palestine" carries out successfully an idea which we have several times referred to—the liberal introduction of ordinary lantern slides into an exhibition which is mainly cinematographic. We trust that this is only the forerunner of many similar shows, and that a revival in the art of making high-class coloured slides will result. Considering the cost of producing a film, that of even the highest-priced slide is small, so that there should be no temptation to show slides which are not perfect in photography and colouring. A point which the promoters of this class of exhibition should not neglect is the securing of something like evenness of quality in both films and slides. If the former are inclined to be flat or soft, it is a mistake to blend with them brilliant, highly-coloured slides. In the show referred to there were one or two dissolving effects, but these were not as good as many which we have seen in the old days. In certain circumstances slides toned by chemical means, as is commonly done with cinematograph films, would probably form a more harmonious combination than hand-coloured pictures.

* * *

An Enlarging Point. Users of enlarging lanterns with large condensers often fail to see the disadvantage under which they labour when using small plates. If we compare two lanterns, with equally strong illuminants, one having a condenser capable of covering a whole-plate and the other covering only of a quarter-plate, the focal lengths of the condensers being in the same proportion to their diameter, we find that in the smaller apparatus only a quarter of the exposure necessary with the larger one need be given to secure the same result. It is, therefore, an excellent plan to have a smaller condenser fitted so as to be interchangeable with the large one when small negatives of considerable density have to be dealt with. Moreover, more range can be obtained for centreing the light in the case of extreme enlargement or reduction. Another plan is so to arrange the negative carrier that it can be brought forward into the convergent cone of rays so that a greater portion of this is utilised. This, unfortunately, necessitates a modification of construction which would be difficult with most existing lanterns, but which could easily be made by anyone building his own enlarger. Another desideratum is a fine adjustment for focussing, which can be operated when the lantern is several feet from the easel. In some of the early cantilevers there was a screw adjustment in the middle of the front board, which could easily have been fitted with a long detachable key; an idea has been revived in a different form by Messrs. Houghtons.

Pressing the Button. At first sight nothing would appear to be easier than to actuate the release of a hand camera, yet for all except the most rapid exposures a certain amount of skill is required, and the value of the film and plates wasted every year through unskilful button-pressing represents an income most of us would like to enjoy. The operation is in some respects similar to target shooting, inasmuch as in either case it is fatal to good results to give a jerk at the critical moment. The skilled rifle-shot has a steady pull on his trigger while aiming, so that only a little additional pressure is necessary when he decides to let fly; and it should be the same with the hand-camera user. A thing to be guarded against is holding the camera loosely and "jabbing" at the release with the thumb or finger. Releases vary in pattern, but it is nearly always possible so to hold the camera that the thumb and fingers can be placed in opposition to each other, so that the necessary force is applied in the form of a squeeze. In the folding Kodaks this is usually to be done by placing two fingers under the baseboard while the thumb is on the release. As a rule, steadier exposures can be made with a hand trigger than with a ball and tube or Antinous when the camera is held, as one hand has to be entirely devoted to the release, while, of course, the contrary is the case if the camera is mounted on a stand, especially if "bulb" or "time" exposures are to be given.

* * *

Apparatus Repairs. When something goes wrong with photographic apparatus there is often the inclination on the part of the photographer to have the necessary repairs done by some local man, but if the damaged apparatus is of value this is certainly not a wise proceeding. In the first place it is extremely unlikely that any ordinary cabinet-maker has suitable material for the job even if he possesses the requisite knowledge of what has to be done. In addition to this a knowledge is also required of the strain put upon the particular part in order that the job may be satisfactory: this, unless he be also a photographer, an ordinary cabinet-maker cannot be expected to possess. A case in illustration of this came under our own notice recently. A photographer had the misfortune to fracture one of the upper sections of his field-camera tripod, and thinking that it was only a very simple job entrusted the fitting of a new section to a local carpenter. The tripod was made of ash, and as the man had no ash in stock he substituted oak, also making a clumsy job of letting in the brass fittings that grip the turntable. Only a fortnight later when setting up the camera, owing to the fact that the oak had very little "bend," and drew the corresponding ash section much out of its original "bend," the latter snapped, making the tripod practically useless at the time. In the end the job cost about three times as much as it would have done if the services of a competent repairer had been obtained in the first instance.

* * *

"Spotting" or Finishing. We are afraid that many of the modern race of portraitists who have entered the profession without previous experience as assistants in an old-established studio fail to appreciate the value of judicious hand work upon their prints. They are content with the removal of actual defects, and neglect opportunities of improving the general appearance of the picture by a little "working up." When glossy papers were exclusively used it required a considerable amount of skill to work upon them so as to preserve an even surface, but with the almost universal use of matt surfaces anyone who has a little artistic instinct can do much to redeem a print from mediocrity. There is just now rather a tendency to discard brush work in favour of chalk or black-lead, stumped or rubbed on. While this serves well for toning down flat surfaces it is not suited for filling in details in drapery, and still less for work upon the face, as there is a lack of that crispness which is so characteristic of good brush work. It is not to be expected that a first trial will give entirely satisfactory results, and a good deal of practice upon waste prints may be necessary, but once the requisite knack is obtained the work is very easy. A very necessary factor to success is the possession of really good sable brushes. These should be procured from a good artist's colourman, and each one tested before purchasing; about one in twenty of the "spotting" brushes sold as such are fit for nothing but the roughest work.

SOME CRITICS ON "LIKENESS" IN PORTRAITS.

It is sometimes said that the essential of a photograph is that it shall be a good "likeness," and that whether it is a "picture" or not is only of secondary importance. But do sitters want a good "likeness" and nothing more?

Much depends upon the meaning given to the term "likeness." Ruskin says that "We constantly recognise things by their least important attributes, and by help of very few of those: and if these attributes exist not in the imitation, though there may be thousands of others far higher and more valuable . . . we deny the likeness; while if these be given, though all the great and valuable and important attributes may be wanting, we affirm the likeness. . . . One portrait of a man may possess exact accuracy of feature, and no atom of expression; it may be, to use the ordinary terms of admiration, bestowed on such portraits by those whom they please, 'as like as it can stare.' Everybody, down to his cat, would know this. Another portrait may have neglected or misrepresented the features, but may have given the flash of the eye, and the peculiar radiance of the lip, seen on him only in his hours of highest mental excitement. None but his friends would know this."

This was, of course, written of paintings, but the same points arise in the criticism of photographic portraits. Lewis Carroll clearly recognised that something more than "exact accuracy of feature" is desirable. He deals with the subject in that amusing parody on "Hiawatha" wherein the hero photographed a family group, and—

"Did at last obtain a picture
Where the faces all succeeded—
Each came out a perfect likeness.
Then they joined and all abused it,
Unrestrainedly abused it,
As the worst and ugliest picture
They could possibly have dreamed of;
'Giving one such strange expressions—
Sullen, stupid, pert expressions.
Really any one would take us
(Any one that didn't know us)
For the most unpleasant people.'
Hiawatha seemed to think so,
Seemed to think it not unlikely."

There are few people who ask, as Oliver Cromwell did, to be painted "wart and all." A cynic might say that the most successful portrait is that which flatters enough to satisfy the sitter without going so far as to provoke the derision of the sitter's friends. How often does the receptionist hear, "This one pleases me most, but my friends do not think it is like me."

Hazlitt, who confessed that he found more pleasure in painting than in writing, mentions "likeness" in one of his essays. "There is always something to be done or to

be altered . . . something is wanted to the nose or to the eyebrows, it may perhaps be as well to leave out this mark or that blemish . . . a squint or a pimple on the face handsomely avoided may be a link of attachment ever after. He is no mean friend who conceals from ourselves, or only gently indicates, our obvious defects to the world. I do not conceive there is a stronger call upon the secret gratitude than the having made a favourable likeness of anyone; nor a surer ground of jealousy and dislike than the having failed in the attempt."

The wise photographer will try to earn this "secret gratitude." He will so pose and light as to emphasise the sitter's most pleasing features and expression, and, even then, there will be something left for the skilful retoucher's knife or pencil—"to leave out this mark or that blemish."

PRACTICUS IN THE STUDIO.

[Previous articles of this series, in which the aim of the writer is to communicate items of a long experience in studio portraiture, have appeared weekly since the beginning of the present year. It is not thought possible to continue the series to the length of that by the same writer which ran through the "British Journal" some years ago, but if any reader among the younger generation of photographers, and particularly those engaged as assistants, has a particular subject which might be dealt with, his or her suggestion will be welcomed. The subjects of the previous articles of the series have been as follows:—

A Talk About Lighting (Jan. 3).
The Camera and the Lens (Jan. 10).
Managing the Sitter (Jan. 17).
Backgrounds (Jan. 24).
Studio Exposures (Jan. 31).
Artificial Lighting (Feb. 7).
Printing Processes for Portraiture (Feb. 14).
Studio Accessories and Furniture (Feb. 21).
The Surroundings of the Studio (Feb. 28).
Studio Heating and Ventilation (March 7).
The Postcard Studio (March 14).
The Printing-Room (March 21).
About the Reception Room (March 28).
Home Portraiture (April 4).
Portable Studios (April 11).
Copying (April 18).
Handling the Studio Camera (April 25).
More About Lenses (May 2).
Enlargements (May 9).
Advertising the Studio (May 16).
Mounts and Mounting (May 23).
Business Methods (May 30).
Photographing Children (June 6).
Portraits of Elderly People (June 13).
Something about Lenses (June 20).
Hand Cameras for Professionals (June 27).
The Dark-Room and Its Fittings (July 4).
Plates and Their Work (July 11).
Apparatus Repairs and Renovations (July 18).
Posing the Head (July 25).
Intensifying Portrait Negatives (Aug. 1).
Workshop Jobs (August 8).
The Personal Factor (Aug. 15).
The Keeping of Negatives (Aug. 22).
Reduction of Negatives and Prints (Aug. 29.)
Leaky Roofs (Sept. 5).
Blinds and Curtains (Sept. 12).
Miniatures (Sept. 19).

PRINTING PORTRAIT NEGATIVES.

When we have obtained as good a negative as we can, we have got about half way towards our goal, which is a good print, and, let us hope, also a good picture. Beautiful as were the results obtained by printing upon albumenised paper, this process greatly retarded the progress of photography as an art, for not only did it demand one particular class of negative to give the best result, but there was only one surface. There was little possibility of varying the degree of contrast, although those who sensitised their own paper could effect this to a slight extent by varying the strength of the silver bath, and the range of colour was limited, a warm brown to a purple-brown being all that was obtainable. Any attempt at black or cold tones usually proved unsuccessful, except in a few cases, generally with architectural subjects. This is all changed now, and the difficulty is not to do the best with one medium, but to select from about a hundred varieties of speed, contrast, colour, and texture of surface those which will yield the class of print we require.

The average photographer is, I am afraid, rather too conservative in this direction, and his reputation as an artist is often reduced, unwittingly, in consequence. It is not unusual for one grade of paper to be used, either toned or untoned, for all classes of work. Unless the business is simply that of a "portrait mill" this cannot be considered as satisfactory.

Putting aside for a moment the question of the character of the emulsion used, the surface and colour of the paper have a great effect upon the appearance of the finished picture. Many years ago—I believe before the introduction of bromide paper—a well-known worker said as a gibe: "When you have a negative which is good neither as a photograph nor a picture, print it on rough paper and call it 'A Study.'" This was a rather unworthy knock at those who were trying to break away from the shackles of albumen and adopting "salted" Whatman paper in the struggle to produce artistic work. Fortunately we have progressed since that date, and rough-surfaced papers have taken their rightful position when broad effects are desired. Artists—I mean those who use the brush instead of the camera—have always realised the value of surface texture as a means of giving effect to their work, and for water-colour have for generations used at least three grades, hot pressed, "not," and rough surfaces, the first being quite smooth, the second slightly rough, and the third with a decidedly granular texture; while a still rougher paper known as "Creswick" was frequently used for bold sketchy effects. Counterparts of all these papers are now to be had coated with bromide emulsion. The smooth and rough grades in various degrees are made by most makers, while a passable imitation of "Creswick" is sold under the name of "Tiger Tongue."

The tint or colour of the paper base is another important factor in the making of a picture, and the general introduction of cream or "toned" papers has made it easy to get pleasing results from negatives which were apt to give harsh results upon a glaring white. These papers give particularly good results in conjunction with sulphide toning, the brown image and cream base forming a very pleasing combination.

The speed of the emulsion often has a very important effect upon the quality of the print, and I always prefer a slow paper to a rapid one, except for enlarging from dense negatives. I do not wish to say that good results cannot be obtained from rapid papers, but that as a rule a longer scale of gradation can be obtained upon slower ones. This is now being realised by some of the manufacturers, and we have very slow papers which require a battery of incandescent lamps or a mercury-vapour tube, to work with a reasonable length of exposure, which will

give prints with perfect gradation from either thin or dense negatives. I earnestly commend these papers to those who are not satisfied with the "quality" of their prints. Moreover, such papers do not call for the extreme accuracy in exposure that is necessary when using the rapid sort. In fairness to oneself as well as to the makers, the latter's instructions as to developers and methods of working should be scrupulously observed. I have known papers which needed a special metol-hydroquinone formula to be condemned because such papers did not give good results with the amidol developer which was successfully used with another brand.

Gaslight papers vary greatly in quality of image, and I have not found them to be so satisfactory for portrait work as bromide. The shadows as a rule are too heavy and the colour too cold, while some do not take kindly to sulphide toning. It must be borne in mind that it is not speed in working nor even a greater degree of contrast that makes the difference between gaslight and bromide. I have used bromide papers which required a yellow light for development, but which needed more exposure than gaslight papers, while the amount of contrast obtainable was about equal with both. I should like to be able to give the names of the various papers I have in my mind, but unless I had tried every brand upon the market it would be unfair to some of the makers to do so.

So far I have dealt with developing papers, because nineteen-twentieths of the portrait work in this country are done upon them, but there are other processes slower in production with which the other twentieth is made, which for quality of image cannot be surpassed, while they have the added advantage of absolute permanency as far as this can be obtained upon a paper basis. The simplest of these is platinum printing, which is regarded by many as being too expensive for ordinary work. This I consider as a mistaken notion, even at the present high price of the paper, as the price of bromide paper has also risen, and the difference in cost between the two is only about half-a-crown a dozen for cabinet prints. This should not be allowed to stand in the way of those who are obtaining first-class prices, while those whose charges are more moderate can easily obtain twice this amount in addition to bromide prices if the permanence of the prints and their artistic quality are pointed out. Black or sepia tones are equally easily obtained, and there is a choice of surface and tint. Negatives of rather better quality are required than for bromide work, as a rule, but I have seen some which gave better results with platinum than with bromide when it would not have been expected, the surface of the platinum paper doing away with the impression of empty shadows, which arose when emulsion papers were used.

There are, I am sorry to say, comparatively few portrait photographers who use the carbon process for any large proportion of their work, and this is to be regretted, for it covers a wider range in colour and surface than any other process. The reason for this neglect is, I believe, to be found in the very different class of manipulation required, which does not fit in with other work. Anyone who would use carbon exclusively, except for proofs, would, I believe, find the process as easy and cheap as bromide. The only essentials are a roomy sink and a constant supply of hot water. Exposure is easily provided for by installing one or more mercury-vapour tubes. I found that one of the long tubes fitted with a proper frame would serve for twenty-four half-plate frames at once, the time required being from ten to fifteen minutes. With a little experience it is possible so to arrange the distances of the frames that the whole batch may be taken off at once, no skilled labour being necessary. If no other process were used all the negatives could be reversed and double transfer avoided. Then carbon printing is easier than P.O.P. if the necessary washings, toning, and fixing is taken into consideration.

I believe many photographers who are not satisfied with their toned bromides would find a great advantage in adopting one or other of the self-toning collodion papers now on the market, as these give very fine results from average negatives. There is, however, a danger of bronzing in the shadows if very strong negatives or those having clear glass in the shadows are used. There is a considerable range of colour and surface of the paper base available, and a good range of tones from sepia to grey by very simple modifications in the treatment. An experiment worth trying is to print a negative in toned bromide and self-toning paper, and to compare the results. In the majority of cases the verdict will be given to the latter.

In this chat I have given no working details, my object being to raise the question in the minds of my readers as to whether they are getting the best possible results from their negatives. There are many who do not care for quality as long as the sitters will accept the prints without demur; but it is not this spirit that has brought photography to the present stage of development.

PRACTICUS.

SOME PERSONAL IMPRESSIONS OF THE LONDON SALON.

THE promoters of this exhibition admit that the great difficulty in its organisation is the question not of what to get in the way of pictures, but of what to throw out. From the far ends of the earth come scores and hundreds of prints with fresh motives, new ideas, unsuspected technical worth, and undisputed artistic feeling. The old brigade of stalwarts at home are very hard put to it to keep their end up. Yet what can be done? It would be palpably foolish to sacrifice new throbbing blood to the claims of the organisms of past decades. The art of photography demands that whatever is worthily done, let it be done where it will, should be recognised in London, shown, appraised, and ranked.

To do this with absolute fairness to the merit of every print submitted would require showrooms at least as big as the National Gallery. Regarding the question from other standpoints, everybody is agreed that the Pall Mall Gallery is plenty large enough. The smaller the show the choicer.

This theory, unhappily, works out to the exclusion of the representation of many old friends whose work has in no way fallen from its finest standards. The practice of the theory has likewise its regrettable side, for it means that the world's output must rely for its recognition upon the judgment of a handful of Englishmen.

These points are as old as photographic exhibitions. They will never be settled to the blissful satisfaction of all concerned. The only way to keep pace with the lifting level of artistic expression in photography is to have more frequent exhibitions. Failing this, the selection must be still more rigorous than it is. Perhaps it would be fair to show no more than one example of any man's work.

To stroll round the Pall Mall Gallery is to be persuaded that the principles applying to artistic photography are now thoroughly understood by great multitudes of workers. The best things are perhaps not very much better than the best of past years, but there are many more that come nearer to their standard. It is impossible to find here a print that has not

much to recommend it; and it appears that the gallery could have been filled over and over again with work equal to the lowest level of things shown.

All this means unquestionably that pictorial photography has established itself as a satisfying means by which those who have emotions to express can do so in an artistic way.

It is no less certain that the practice is highly educative; for one sees the results of original and individual observation on all sides. The fascinating mysteries of light are obviously drawing countless votaries in all the Dominions. Appreciation of natural effects has entirely taken the place of mere cheap-jack "stunts" which used to flood the Salon years ago. The stunters, I hope, have found that the great B.P. (and incidentally the B.J.) cannot be fooled. Since Nature and Art have knocked up a closer acquaintanceship in pictorial photography they have rendered it a more popular, more earnest, more satisfying and more educative cult. And of another thing we may be certain: the dealers must find this change to a "sweet reasonableness" more profitable.

Perhaps one of the most striking examples of the appreciation of what may be called the inner call of Nature is F. O. Libby's "The Land of Desire" (21). This, at a close view, one would dismiss as an empty blue-tinted print, positively unphotographic in method, and exhibiting in subject none of the characteristics which the camera is chiefly fitted to portray. But let the spectator get far enough back from this print to see it as it should be seen, and he will find it take on a new significance. He will then appreciate what the photographer sensed in contemplating the actual scene: the vastness, the loneliness, the uncompromising lack of the pretty littlenesses of landscape, the inexorableness of Nature.

When a photographer has arrived at this point in his observation and susceptibility before Nature, he has become something of the poet, at all events, and it should not be a far step to become an artist of the true sort. That completion depends upon technical skill to secure pictorial wants, and in photography such skill is fortunately not hard to come at.

It appears to me, though I hate to say it, that this unsophisticated, susceptible outlook on Nature prevails more in the fresher conditions of the Dominions than it does in the Old Country, where sophistication, bred on a medley of traditions, keeps our men always fitful; trying a "new line" here and "another style" there. Much cleverness is expended in these attempts at picture-making, and the results are usually charming enough; but it is the charm of the echo of past thought and past ideals. No doubt the Colonials, too, would gladly arrive at this if they could; but they can't. Their environment pulls them out of the temple into the open. Tradition, to them, is a thing to take in doses, for a change. It is in our blood. That is why we have our Misonnes, and Keighleys, and those others who build up genre work with colossal patience, all for the sake of an idea.

In L. Misonne, whom I am truly glad to welcome back, there is an obvious reaching after the traditions of later (not the latest) French landscape painting. It is an ideal of much sweetness; but, of course, it is not in the spirit of the uninitiated youth with a camera. Misonne's "Le Passage d'Eau" (198) is as near a reproduction of a Corot as a photograph could well make. But because, in "Dinant" (205), he weds the irresistible charm of his style with a touch of the direct breath of Nature, one is the more stirred with this bewitching town and river scene.

P. Douglas Anderson hails from San Francisco. In his print called "A Corner, Palace of Fine Art" (228) there is the clearest appreciation of the quality of luminosity that has ever been presented to my eyes by photography. On the columns and walls of the building the sunbeams tell with force that is relatively true to Nature; but something yet is saved for the sky itself, which is more than merely high in tone. It is luminous. It has a distinctly different quality from that of the parts that only reflect light, and that difference is conveyed to the mind as the difference in quality between direct and reflected light.

A few other prints come near to this example in the same respect; but, generally speaking, photographers have not yet initiated themselves into the esoteric mystery of luminosity. Can't they see it; or don't they care? Perhaps they are still so dead-set upon that sort of "quality" which comes of low rich tones that they will not be drawn aside from their art to our nature!

There are two other prints that are veritable Nature songs: two landscapes by John Paul Edwards, of California, "Hills of California" (116) and "The Valley of Peace" (117). The first not only presents a scene made up of the romance that lies in a scenic composition of hills and trees, but shows how the beauties of form and composition are enhanced a hundred-fold by the light-entangled vapour that fills all the spaces before the different planes of tree-banks and hillsides. "The Valley of Peace" is an open expanse beyond which hills seem to occur for ever as one looks through the light veil that shrouds them. This naturalism has a universal appeal. Everyone with whom I compared notes extolled these two things. Nevertheless, their attractions are not usually characteristic of the best camera-work in this country.

However, Lionel Wood, an Englishman, has triumphed on similar lines in his astoundingly convincing "Aeroplane in Flight" (163); where the machine detaches itself in a wonderful way. It is in the air. You can feel space all round it. Below, the earth is dimly seen, with its fields and hedges, across which a mere white scratch of a road stretches from side to side. Up in front and yet somewhat below the machine is the tip of an enormous cloud shining in the light. Perhaps it is because aero-photography has started from a new point of departure that it has been able, in this instance, to present its own case, free from the sophistications of the camera-studio.

"The Sunlit Sands" (147) is from New South Wales. Its author, M. Mackinnon, has successfully given the horizontal feeling of the stretch of level ground that carries the eye back without any need for the reasoning and adjustment necessary in fully half the pictures of similar subject-matter. J. C. Carlton (Los Angeles) gets the same flatness of retiring ground in his shore scene, "The Closing Day" (224), overspread by a superb sky.

John Keane is a man on our side again. His "Waterloo Bridge" (340) has air, breadth, and light. It gives the grandeur of the Thames; but there is nevertheless a touch of something lacking to give that compelling confirmation that rouses even the jaded mind to enthusiasm. That touch reappears in "To the Open" (402), a yacht speeding through a glistening sea. But here again one learns that its author, Arthur Ford, is an Australian.

If these generalisations are anywhere near the truth, it would follow that the literary note, poetry and romance derived from tradition rather than from Nature direct, would be stronger in Britain. And this conclusion is, indeed, borne out by facts. Alex. Keighley catches this spirit here as ever. "The Rising Moon" (83) is inspired by an inner consciousness of what such subjects should be, as well as by the actual view. Nobody who knows believes that this print is the result of an exposure upon such a scene as is here depicted. And on examination we find that the texture of the trees is sophisticated. It is not unlike wire netting. The trees of the wood have none of that impenetrable solidity which, even in winter, they present under a night sky with the moon behind them. But the ruling mood is there right enough. Again we have all the romance and mood of an Alpine valley in "A Swiss Landscape" (82); but Mr. Keighley has not thought it necessary to give us a luminous sky. His best success is, in reality, the effort in less traditional picture-making called "Early Morning" (87). This "goes back"

in proper stages to the uttermost distance; it gleams with light which catches the wind-ragged smoke from the chimneys of an old town through which the ample surface of a river reflects the light from the sky. It is less "romantic" in the literary sense of the word, but far more naturalistic.

S. Bridgen starts from the same point of artistic vision as F. O. Libby, whose "Land of Desire" I have referred to. Mr. Bridgen feels the majesty and tranquility of late evening in his dark scene of large trees and wide sky. "A vast and tender peace, etc." (168). This also must be seen from a proper standpoint, when its full poetic purport finds expression. There is a different mood in W. Burgess's "Romantique" (414). It is a Watteau setting without the picnic and the music-party. Evening has come and gaiety has given place to brooding, but the charm of Watteau's artificiality remains. The visitor will find many examples from over the seas, in which the romantic note and the note of sentiment are wrongly struck.

When the Colonial mind attempts the romantic with the help of the figure, it usually "o'erleaps itself and falls upon the other side." It is a kind of thing that does not come naturally to a mind that has not been steeped in the romance of classical art; but by the effort of a severe pose the sons of the Dominions have often made outstanding successes in pictorial romance. To the Britisher it is as easy as shelling peas. He can do it without the adventitious aid of darkness and mystery, such as Fred Archer relies upon in "The Supplicant" (253), where a tiny figure in the nude bows itself before a black idol in a vasty and dismal hall. Louis A. Goetz gains nothing by his little figure contorting itself in a manner quite beyond the occasion of a "Greeting to the Mountain" (260). Nor are the maniacal acrobatics of "A Goddess of Nature" (42) anything but a blot upon a superb mountain and shore view, sent by Louis Fleckenstein; and the same criticism is justified in his "Play of the Winds" (108), where similar conditions and qualities exist. Fortunately, Mr. Fleckenstein's portrait and landscape reputation is proof against these little figure shortcomings.

The introduction of the nude into a landscape setting has become a distinct style of work, and has been carried to a high level here at home. I think I am right in saying that Miss Kate Smith started the ball rolling. To this show she sends "The Little Nymph and the Little Chickens" (431), in which the nymph wears draperies.

Perhaps Francis Jay has scored highest this year in the classical style of work by his rather dark, but well-realised fancy, "La Source" (75), where a nude damsel crouches, not quite at the source of a stream. Here there is a distinct idea: a personification of a natural phenomenon in the classic manner. A. F. Kales's "Spirit of the Winds" (104), though a fine print, has less inspiration. His figure is tortuously posing and waving a sheet, or a blanket. There is nothing of that silent inner spirit that has significance in classic allusion. His "Nude Study" (105) frankly disclaims such allusion, although it is placed in a dim place, and is obviously struggling with some mental or physical difficulty. As a nude study it is certainly beautiful. Its flesh, most of which is in a half-light of even quality, receives the touch of a gleam on the face, neck, and flank; and as a specimen of womanly loveliness it is surely all one could desire. I speak for myself.

The nude studies of Mr. and Mrs. Bertram Park, are however, all things considered, the best in the show. Yvonne Park's exquisitely rendered tones and textures in "The Casket" (145) are an æsthetic joy. Here is perfect consistency in the tonal scheme; gentle, but most telling relief, fascinating lighting, subtle modelling; unstrained, yet unhackneyed posing, and delightful quality, especially in the head and neck. The way the contours are managed evinces great feeling and skill. Bertram Park's "Study" (2) is perhaps more entirely Greek in its lines, and is a stronger presentment altogether, but it lacks the irresistible fascination of "The Casket." Its middle tones are prevalent, as in Mr. Kales's "Nude Study"; but it has, as well as high-lights, slight passages of deeper shade which give it the look of stone, and possibly have much to do with the flying back of one's thoughts to the sculpture galleries of the British Museum as one contemplates the print. I should also mention "Study" (157), an upright figure, beautifully lit and modelled. "Pandora" (22) is another nude by Mrs. Park, but little less fine than "The Casket."

One of the works which will impress the visitor most will be F. J. Mortimer's further version of his last year's success with troops at a railway station. This is "The End of the Trail" (85). Perhaps the grouping of the men is in this print even more successful, although the composition misses the fine arch that was of such striking importance in "The Gate of Good-bye." But here the figures have more individual interest. The lighting is exceptionally fine, and the relief of light and shade effective to a high degree. A similar subject, but one which is less deliberately pictorial, is Hector Murchison's landscape called "The Fortune of War" (43), which depicts a large squad of German prisoners laden with timber marching down from the hills. It is a striking work, full of bustle and light, and is just the kind of valuable document we did *not* get from the post-impressionistic and futuristic draughtsmen whom a sapient Government commissioned to make exactly such records.

Humour is not abundant; but John H. Anderson's "Gentle Saurians" (4) are distinctly comic, with their brotherly affection and smiling expression. They make a capital composition, and have that ever-present quality which distinguishes all Mr. Anderson's work. There are several examples of it here. To European eyes there is comicality likewise in the excellent pair of Japanese actors contributed by C. P. Crowther, which are entitled "No" "Performers" (268 and 283). They are striking subjects rendered by beautiful prints.

A large and powerful example of the gum process apparently is sent by J. MacSymon, "A Roaring Torrent" (112). It is a most effective piece of work, masculine and broad. Another print, remarkable for the process by which it is executed, comes from W. R. Bland, called "Under the Scaur" (368). This choice piece of woodland scenery has a texture very like that of the gum process, well suited to the bark of the foreground tree. The variety of effect offered by different printing methods is a matter of importance to resourceful and discriminative workers. The last-mentioned pair of prints show a style of treatment well suited to their subjects. The delicate nuances of an effect of mist, however, are not served by a granular process; and Walter Selfe's beautiful "Autumn Morning" (131) gains all it needs in the smooth method he adopts. It shows the remarkable effect of transparent haze through which the details of malt-houses or oast-houses in the middle-distance can be discerned if one looks for them. A similar clean and smooth method renders the whole tale of architectural details in J. R. H. Weaver's Oxford interiors, "Entrance to a College Chapel" (72) and "The Divinity School" (80). In the same category would come Ch. H. L. Emanuel's choice view of "The Courtyard" (243).

Portraits and figure studies are, perhaps, less remarkable on the whole than landscapes. Certainly the British photographers are holding their own in this section. The most outstanding examples are from Herbert Lambert, who sends several things of real beauty. He works in a perfectly unaffected manner, but in various styles. There are large vignetted heads in grey, and half-length figures which are broad and full in tone, but what fascinates one most in them all is their human charm. Such things as "Madeleine" (111) and "Portrait" (204) are covetable, even though the sitters be quite unknown. W Crooke is seen to best advantage in "Sir Henry Wood" (188). Louis Fleckenstein repeats his former triumph of the "War Widow" in "Miss Lucille S." (315), a gloriously-toned

and animated portrait, of fine pose and splendid lighting. Less choice in treatment, but of great power and charm, is the "Happy-go-lucky Mexican Boy" (195), in which the lighting and management of the edges show much artistic feeling. Marcus Adams heads the ranks of quite a number of photographers contributing baby portraits of all descriptions.

R. Polak continues his most ingenious reconstructions of Dutch seventeenth century genre. He is beginning to feel the need for gradation and massing of tone, and the avoidance of hard edges, and his grouping is less scattered. These clever works are, of course, no longer novelties, but they maintain their charm, and I believe that their author will do even better yet with them.

One of the angle walls is filled with prints of a decorative character in the Japanese manner. They show fine taste and feeling.

Works in colour, too, may please some visitors. I confess to being left cold by these never-ending attempts to push photography where it evidently refuses to go, although it must be confessed that the examples by Fred Judge come very near to the colour of nature. His process is the most hopeful of them all. But with pigments that are not sufficiently transparent it is impossible to avoid a sad degradation of colour in the darker parts, where three heavily charged transfers of pigment have to be superimposed.

There are many choice works on the three screens, but they will get less attention than they deserve, both from visitor and critic. It is impossible to see them without uncomfortable eye-strain and undignified posturing, owing to insufficient illumination, reflection in the glasses, and low position. If these screens were placed transversely, instead of longitudinally to the greatest measurement of the room, some of these disadvantages would be avoided.

It will be agreed that the show altogether, and considered from every standpoint, is the best we have yet seen.

F. C. Tilney.

THE PRODUCTION OF PERFECT SEPIAS.

I think that the majority of photographers will agree, when I say that more poor sepia prints are turned out than black and whites. Also that the production of sepias is often associated with much trouble, waste, and ultimate disappointment. The reason is simple, for in all popular sepia processes a black and white print is required first of all. Therefore, sepia means extra work, and secondly there is no law that a passable black and white must necessarily result in a passable sepia if toned. Therefore, sepia means more risk.

The extra work cannot be avoided, but the risk can be minimised to the point of guaranteeing twelve perfect sepias from a dozen perfect black and whites. It is only necessary to study the peculiarities of the process, and to take sufficient care in carrying it out.

The most common faults of bad sepia prints are:—Muddiness and poor quality of colour; double tones; spots; blisters, washiness, and "weight." This latter being that heaviness gained sometimes in drying.

Let us take them singly, and consider their most common causes and the simplest means of prevention.

Muddiness.

Sepias that are muddy or those whose colour is not pleasant may be produced in different ways. A thin or flat negative will not readily give a print which will tone well. An over-exposed print may appear fairly good in the black and white stage, but tone muddy in spite of careful toning. Stale developer or an excess of bromide will also influence the quality of prints which are subsequently toned. A weak sulphide solution, or an out-of-condition hypo-alum bath will cause sepias to be poor in colour quality.

To obtain a pleasing colour, good negatives with plenty of body in them should be made in the first place. Fresh developer should be used for the prints and the bromide used carefully. Exposures may be on the short side but never over, unless printing on a vigorous paper from a bold negative, in which case over-exposure and quick development may prove decidedly useful. If the toning is done by bleaching and sulphiding, the sulphide must be fresh and not too weak. I find a 1 per cent. solution right for most papers, but opinions differ on the point, some using stronger and some weaker baths than this. With weak solutions there is a risk of over-working the sulphide, however, and, if a quantity of prints are being put through, it is wise to keep renewing the bath. Also to soak each print separately for at least a minute before putting another on top of it.

With hypo-alum, to get the best colour the bath should be just ripe, not too fresh and not too old. A fresh bath has a tendency to give pale yellowish tones, and an old one dark, cold tones.

Before bleaching a print, if it is on the weak side, a preliminary soak in the sulphide solution will have the effect of making it deeper and colder.

A flat print can be improved by adding to the bleacher an amount of potass bichromate equal in weight to the ferricyanide.

Improved colours can similarly be obtained by soaking the prints in bichromate solution—of a fairly deep salmon tint—previous to bleaching in the usual bath.

Very cold tones may be produced by giving the bleached prints a run through amidol developer before sulphiding. The tone will depend on the time they are in the amidol; the longer it is the colder the tone.

Double Tones.

Who has not at some time or other seen a toned enlargement marred by ugly blue-black patches? I mention enlargements rather than small prints, because the former are more liable to the particular markings, and also more likely to escape immediate destruction when stained or double-toned. Admittedly, a good worker should not pass an enlargement where he would destroy a small print, but nevertheless there seems to be a much bigger proportion of double tones among large stuff than small.

By far the commonest cause of double tones is imperfect fixation. This is why the large stuff is more likely to suffer. A dab and a push may suffice for a postcard, but is useless for a 20 by 16. A print intended for toning—or, in fact, any bromide or gaslight print—when developed should be immersed thoroughly in active fixing solution; in other words, it should be attacked all over by good, clean hypo at once. If any delay is necessary between development and fixing the print must be kept immersed in pure water or in a recognised stop bath. A bromide or gaslight that is being "fixed," in places by hypo solution and in other places by air bells or remnants of developer, will record the position of such air bells and developer on being toned.

The record will be in blue-black spots and patches, so the way to prevent such double-tones is obvious.

Similar markings have been said to occur owing to excess of heat when using hypo-alum, also to air bells in the toner. In both cases prevention is easy.

"Faking" in development and local reduction of a print in the black and white stage will cause double toning, but in these cases the secondary tone will be paler or yellower than the normal.

Gaslight prints from very thin negatives are liable to tone in alternate warm and cold streaks. Contaminated developer will cause similar markings to appear on toning.

There is one kind of double-toning which is not so obvious or so offensive. It is a peculiarity of certain papers, and consists of cold high-lights and warm shadows.

Some prefer this effect to the normal, but if not liked it is easily avoided by changing the grade—not the brand necessarily—

of paper. In one well-known make are two kinds of platino-matt bromide: one tones to deep brown and pure white, the other to deep brown and pale blue. In black and white they are almost indistinguishable. Another equally popular brand gives pure black and pure white, which, on toning, becomes browny-chocolate and cream. This sort of double-toning is worth cultivating.

Spots.

All things photographic suffer at times from spots. Sepias are no exception. White, red, puce, blue, and black are the varieties I have met and combated. Maybe there are as many other kinds as well.

White spots are caused by hypo dust knocking about the workrooms. A speck of this, too small to be seen, may lodge on the print and form Farmer's reducer when the print is bleached. Hence the white spot. Another white spot is due to over-fresh paper. This spot appears on development, and is not unlike that produced by an air-bell.

Red spots may be brought about by impurities in the water supply. A linen bag tied over the tap will keep grains of dirt and metallic matter back and helps to prevent spots. Dark spots—seen by transmitted light—in the paper itself (not the emulsion) often give rise to red spots on the surface when toning. Such paper should be rejected, or the spots kept to dark parts of black and white pictures where they will not be noticeable.

Puce or purple spots that appear during drying are due to dust. At the first sign of them the drying-room, or cupboard, or rack should be thoroughly cleaned and overhauled.

Blue spots may be caused by traces of alum in the print, when it is bleached. Any other matter capable of forming Prussian blue with ferricyanide will give rise to these spots if such matter is in the print, or the water, or adhering to the dishes. Care and cleanliness are the best preventives of blue spots. They can be removed sometimes by application of a strong alkali, or by hydrochloric acid, but their removal is not a sure proceeding at any time.

When using the copper-ferricyanide method I have often met with black spots, but have never been able to trace the cause or devise a cure. Re-development will, by turning the rest of the colour black, cause them to disappear, leaving the print as it was prior to toning.

Blisters.

Blisters usually occur with delicate and poor papers, and are caused by air getting under the film of gelatine. Just how the air gets there it is not always easy to see, though some papers are so porous that a bubble imprisoned beneath a "face-up" print will percolate through the paper until it is enclosed between the paper and the gelatine.

Warm or strong sulphide solution will tend to cause blisters, as will also a falling stream of water or an over-long washing. Prints from the hypo-alum bath may be blistered by a sudden chill. To prevent these unsightly marks—which may dry down but don't often disappear totally—care should be taken with the dilution and temperature of sulphide and an anti-splash device used on the washing tap. Washing should not be protracted—ten minutes should suffice. With hypo-alum, prints should be allowed to cool down before being put into cold water. A hardening fixing bath is useful when delicate papers are being handled.

Washiness or Want of Depth.

The washed-out yellowish sepia print is not a thing of beauty or one to be repeated.

It is usually brought about by insufficient care in making the black and white print, but may be due to other causes. A good print which has been correctly exposed and developed will not tone washy unless something is wrong.

Hypo in the print or bleacher will do the mischief. To guard against this, prints may have a preliminary soak in pink permanganate solution. If the pink colour is not turned yellow or entirely bleached in two minutes the prints are safe for bleaching. If the bleacher is not known to be uncontaminated, new should be made up.

Fresh hypo-alum has a reducing effect. This can be corrected by ripening the bath with a few waste prints or pieces of bromide paper.

Heaviness Gained in Drying.

To guarantee that a print will not gain depth when toned and dried requires the consideration of at least three factors. First, the make of paper. Some makes—and also some varieties of the same make—dry up differently to others. Second, the development of the print; and, third, the method of toning. The make and variety of paper must be studied to find out its tendency in this direction. If it tends to dry up dark, then the development must not be overdone. Sufficient exposure should be given to ensure barely full development in one and a-half minutes at 65 deg. F., using a normal developer. With extra bromide new calculations are necessary which may need experiment to verify.

Prints from flat negatives should be slightly under-exposed, so that when fully developed they will look a good shade too light. When toned and dried, the print should be correct in depth and of a fairly good colour. Slightly intensified results can be obtained by using the bichromate bleach on the fully developed but light print, as mentioned in the paragraph on "muddiness."

THERMIT.

A DEVICE TO FACILITATE THE CUTTING OF PLATES FOR SMALL CAMERAS.

MANY users of the vest-pocket type of camera, taking a plate 4½ x 6 cm., probably, like the writer, use also plates of 5 x 4 or postcard size, and may welcome a ready means of cutting up the larger plates for use in the smaller camera. This practice has the advantage of making it unnecessary to stock an extra size of plate and also of ensuring that the small plates are accurately cut. Many of those obtained in the ordinary way are so much below nominal size as to leave practically no hold in the metal form of dark slides. At the same time, the ordinary thin glass used for 5 x 4 plates will never jam in a slide, as sometimes happens with the extra thin glass of which the small plates are made.

The apparatus consists of a cutting gauge of grid form, shown in fig. 1, and a base board with recess for plate shown in fig. 2.

The base is provided with two strips of wood to act as stops for the gauge, which is used in the following manner:—

The edge of the gauge marked L is placed against the stop L on the base, and three cuts are made on the plate lengthwise, using the edges "Y" on the gauge as guides for the diamond or glass-cutter.

The gauge is then reversed so that edge S is brought against stop S on the base, and three cuts are made across the plate, using the guide edges "X" in this case. The plate will then have the appearance shown in fig. 3.

The outer edges are broken off by insertion in the groove provided at the edge of the base for this purpose, and the plate is then broken at the cross cuts. It will, of course, be understood that the plate is cut on the glass side, and that to break off after cutting it must be bent away from the cut to part the glass, and then back again to sever the emulsion. If, however, the cut plates are to be packed away before use, it is better not to sever the emulsion in each pair, as they can then be folded face to face on the gelatine hinge thus formed, effectually preventing rubbing of the sensitive surface.

During the handling and cutting of plates it is advisable to protect the film side by means of a piece of clean white paper the size of the plate. This enables the plate to be gripped between the fingers when breaking off and keeps the surface quite free from glass particles.

If the plates being cut up are post-card size it will, of course, involve only one cut lengthwise, but in this case it is important

to see that the edge L on the gauge or stop is adjusted to bring the cut exactly central with the particular glass-cutter in use, whereas with a 5 x 4 plate a slight variation only affects the width of the strips which are cut off and thrown away.

The construction of this piece of apparatus is fully shown by the sketches which are dimensioned in inches, allowing for the plates

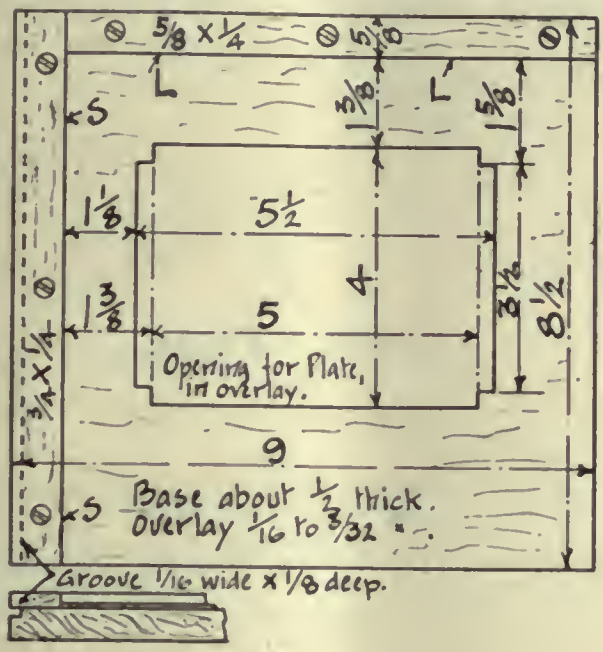


Fig. 1.

being cut ½ mm. smaller than the nominal sizes. It may be mentioned, however, for the benefit of less experienced workers in wood, that the gauge (which is the only part requiring accuracy) can be cut out with a fret-saw and the edges trued up with a

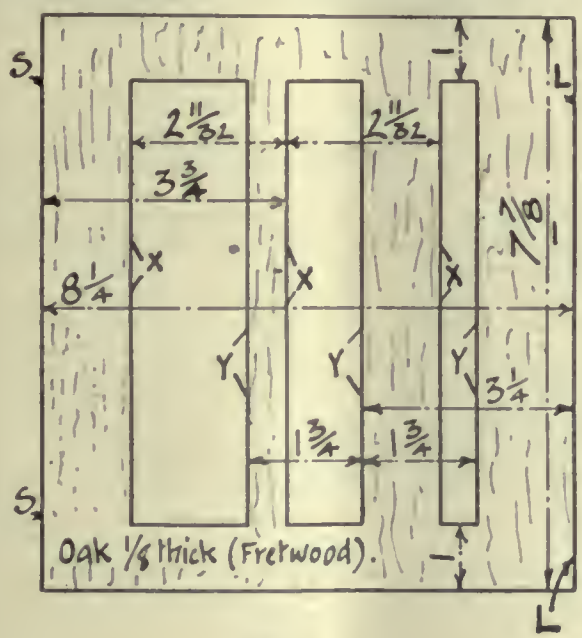


Fig. 2.

sheet of glass paper wrapped over an old negative glass of about 5 x 4 size, thus forming what is virtually a very wide file.

To those who do not possess a glazier's diamond, the following hints upon the use of wheel glass-cutters may be of service:—(1) Give a fairly quick and light stroke such as would be used in ruling a line on paper with a pen and ink, and holding the cutter as the pen would be held. Heavy pressure is not necessary and only results in a jagged cut. (2) Incline the handle of the cutter slightly away from the ruler edge; this will keep the wheel always against one side of its bearing and ensure a straight cut.

The writer has cut up some dozens of 5 x 4 plates by this method, and has found it very successful; a noteworthy advantage being

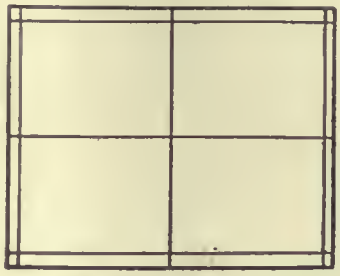


Fig. 3.—Cut Plate.

that if the case of plates suspected of staleness, the cutting off of the outer edges removes any risk of marginal fog in the smaller plates, where the encroachment on the area of the picture becomes a matter of consequence.

VIVIAN JOBLING.

DEATH OF MR. G. A. PICKARD.

WE much regret to announce the death, very suddenly, on Monday last, September 22, of Mr. G. A. Pickard, head of the firm of the Thornton-Pickard Manufacturing Co., Ltd., Altrincham, at the age of sixty-eight.

Mr. Pickard had been chairman and director of the Altrincham firm of photographic apparatus manufacturers for many years, succeeding in that capacity his brother, Edgar Pickard, whose death in the early days of the firm's history deprived him of an active and skilled collaborator. His own delicate health for many years past prevented him from taking an active part in the trade conferences and other functions connected with the industry, and indeed for the past few years the claims of his own business were as much as his measure of physical vitality could discharge. Nevertheless he retained an active interest in it until the time of his death. Those who had occasion to visit him in Altrincham or to meet him on the rare occasions when he appeared at a trade gathering will remember with pleasure the invariable old-time courtesy which was characteristic of his manner and was part of his nature.

The funeral is announced as having taken place yesterday (Thursday) at the Friends' Burial Ground, Ashton-on-Mersey, Sale.

Photo-Mechanical Notes.

Testing Lenses for Process and Copying Work.

THE variety of lenses in regular use for copying and process work at the present time is so large that one is inclined to believe that almost any lens of suitable focal length can be satisfactorily employed in practice, provided due regard is paid to its limitations. But for successful work it is desirable that these limitations be first discovered, and it is more satisfactory to examine a lens in a methodical way, so that one may know exactly how far one may go, than to risk a job turning up one day which the lens is unable to cope with. A 15 × 12 R.R. lens of ancient though reputable manufacture may be found to be quite efficient for the average run of half-tone work up to say 10 × 8, but may fail absolutely on a 15 × 12 line job; while its employment on three-colour work would most probably be fatal to good results. Yet there are 15 × 12 R.R. lenses being used daily for three-colour half-tone, and producing excellent results.

It is not a difficult matter to test a lens thoroughly on a camera, and a few suggestions for those who have the time and inclination to undertake the work are contained in these notes.

A camera one or two sizes larger than the plate the lens is sup-

posed to cover should be used, in order that the definition given by the lens at the edges of its circle of illumination may be clearly seen, and if the camera is mounted on a photo-engraver's stand of suitable length, and a considerable range of reductions is obtainable, it will be an advantage. An ordinary studio stand can be used, however, provided care is taken that the back of the camera is absolutely square with the easel carrying the test object.

As a test object one of the special charts obtainable from most lens manufacturers is best, because the collection of weird designs usually found along the edges and in the corners of these charts readily indicate, by becoming more fantastic than ever, any irregularity in the correction of the lens. The chart is pinned up on the easel or wall and illuminated as evenly as possible by daylight or arc lamps. The parallelism and rigidity of the camera should also be carefully checked, and care should be taken to see that the plate in the dark slide occupies precisely the same position as the focussing screen, as otherwise faults of the camera may be unjustly attributed to the lens. The lens should be exactly in the centre of the focussing screen or plate.

A rough inspection of the image of the chart on the focussing screen may then be made, and the centre of the chart focussed as sharply as possible with the camera arranged for about ¼ diameter reduction, or the greatest reduction which will allow the whole of the screen to be covered by the image. For instance, if the chart employed is 3ft. × 2ft. and the camera a 15 × 12, the image would fill the screen at just under ½ diameter reduction, and the preliminary examination should be made at this reduction. In the case of lenses of long focal length, two or four of the standard charts may be used; in fact, the larger the chart the better. The greater the reduction, the more searching the test becomes, as the lens is being used over a wider angle, and it is mostly when copying large originals at a considerable reduction that lens troubles occur in reproduction work.

Having examined the image visually on the screen at various stops, a plate should be exposed at full aperture. We will assume that a 12 × 10 lens is being tested. The first exposure should be made on a 15 × 12 plate, so that the falling off of illumination and definition at the edges may be recorded. Then stop down to f 16 and make another exposure. These two negatives will suffice to show the practical covering power of the lens, and it will probably be found, in the case of a modern lens, that the f/16 one shows the 15 × 12 plate well covered, although the lens is nominally only supposed to cover 12 × 10.

Now we turn to examine the behaviour of the lens in detail on a plate of its own size. Alter the position of the camera so as to get the image of the chart to occupy exactly the 12 × 10 plate. Then focus at full aperture, and get the image as sharp as possible in the centre of the screen. Three test plates are sufficient, one taken at full aperture, (usually f/8 or f/11), one at f/22, and one at f/45. These will enable the experimenter to judge the largest stop that can be safely used for various classes and sizes of work. The "full-aperture" plate will show any defects of the lens by deformation of the designs on the chart. Lack of correction for blue-violet rays will be indicated by a general lack of definition all over on the negative, although the visual image was sharp. Pronounced spherical aberration will produce a similar effect, but in this case the visual image will also be unsharp. Astigmatism will be indicated by the appearance of the vertical and horizontal lines on the chart, particularly those at the edge; if both are equally sharp, there is none present. Distortion can be readily observed by placing a steel rule along the negative, against one of the lines which is straight on the chart, whereby one is able to see if the line has become curved or distorted by the lens. The other two negatives will serve to show how much any apparent errors are reduced or eliminated by the use of a smaller stop. A comparison of the three negatives will also show whether the focal plane of the lens shifts with different stops, a peculiarity occasionally possessed by even high grade anastigmats, and one which causes considerable annoyance in practice.

If the lens is to be used for three-colour work, a rough test as to its suitability and colour correction is obtained by making three negatives of the chart through tri-colour *gelatine* filters on panchromatic process plates, with a fairly large stop. In this test the focussing should be done through one of the filters, and the filters used must be perfectly clean and free from finger-marks, etc. Cemented filters should not be used unless they are known to be of the very finest quality and to have no appreciable optical defects of their own. When these three negatives are obtained, any difference of focal length under the different filters will be noticeable, and variation of the *size* of image, commonly called the "register," is discernible by superimposing the negatives, or by carefully measuring the length of one or more of the chart lines.

The tests above outlined do not, of course, give results to a very high degree of accuracy, neither do they indicate all that the optician wants to know about a lens, but they are sufficient to enable the user to define the practical limitations of his lenses, and when he has done that, he will know what jobs he can tackle successfully with each lens at his disposal. Further, the test negatives will prove extremely useful if at any time he should have occasion to complain to the manufacturers regarding the performance of any particular lens.

E. KENNETH HUNTER.

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Applications for patents, September 8 to 13:—

CAMERAS.—No. 22,294. Photographic cameras. B. Hinkler.

FLASH LAMP.—No. 22,493. Magnesium lamps for photography and fuel cartridge therefor. A. de Montazet.

PRINTING FRAMES.—No. 22,181. Photographic printing frames. J. L. Troubridge.

SCREENS.—No. 22,119. Cinematograph, etc., screens. H. Dewey.

CINEMATOGRAPHY.—No. 22,410. Moving picture projecting machines. W. E. Johnson, S. Stratford.

CINEMATOGRAPHY.—No. 22,230. Production of films for cinematographs. L. Sawyer.

CINEMATOGRAPHY.—No. 22,043. Cinematograph films and manufacture thereof. J. E. Thornton.

CINEMATOGRAPHY.—No. 22,044. Machines for printing cinematograph films, etc., photo-mechanically. J. E. Thornton.

COLOUR CINEMATOGRAPHY.—No. 22,045. Cinematograph colour films.—J. E. Thornton.

COMPLETE SPECIFICATIONS ACCEPTED.

These specifications are obtainable, price 6d. each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

DEVELOPING TANKS.—No. 119,246 (Sept. 3, 1917).—The invention relates to developing tanks for photographic films or plates carried in envelopes, of the type in which one or more resilient strips or guides forming light-tight slots are provided in the lid through which the envelopes can be withdrawn for exposing the films to the developer.

There is provided above the guides a sliding lid having incisions which engage with the shutters of the envelopes and cause them to be bent so that light-tightness between the guides is further secured, or alternatively the guides may be curved longitudinally so as to interfit loosely.

In the drawings 1 is a tank which preferably may be wedge-shaped by either or both of the sides slanting at the base, and with a hole in the side close to the bottom, from which a small tube 2 is connected with a funnel 3 fastened to the side of the vessel. The bottom may slope downwards towards the hole in order to drain the tank thoroughly.

The top of the tank has a cover 4, which consists of a frame with guides in the form of cylindrical india-rubber cushions 5, firmly mounted in bearings in the frame. The cushions preferably are of very soft rubber on hard cores 6, for example, of wood, and which are so mounted as to be fixed or movable in the frame of the cover.

By reason that the core 6 is rectangular, while the rubber cushion is of circular cross-section, two air-cushions 11 (Fig. 7) are formed, and this tends to secure a softly yielding and opaque connection.

Above the cover is an open frame lid 7, the sides of the open part of which are provided with incisions 8, so that there are a pair of incisions above the middle of each rubber cushion, whereby a better light-tightness between the cushions is attained.

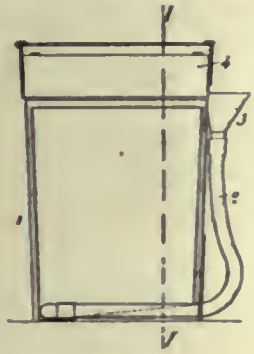


Fig. 1.

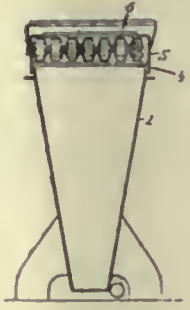


Fig. 2.

The apparatus is used in the following manner, it being understood that film envelopes are used of the kind described in Patent No. 120,572.

The cover 4 with the lid 7 is removed and turned over, and the film envelopes are now introduced downwardly between the cushions 5, the tongue of the shutter of the envelopes being first bent up or straightened and then inserted. The tongue of the film envelope shutter is pushed so far through the space between

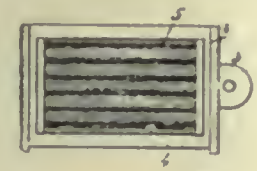


Fig. 3.

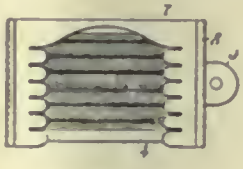


Fig. 4.

two cushions, that the back and holding strip of the envelope are stopped by the cushions, which pinch the envelopes.

When the cover and lid are turned back into their normal position the tongues will all project upwardly through the lid 7 and the cover 4. Thereafter the developer is filled into the tank, the film envelopes are introduced into the developer, and the cover 4, together with the lid, are placed on the tank, after which the shutters of the envelopes are drawn up, whereby the shutters

Fig. 5.

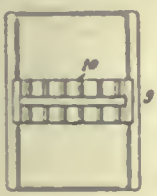


Fig. 6.

Fig. 7.

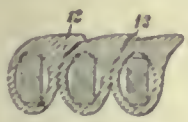


Fig. 8.

of the envelopes which are guided in the incisions in the sliding lid 7, are bent on over the cushions, thus securing light-tightness along the edges of the film envelopes by shading the spaces between the cushions and the edges of the films.

As a modification, it may be mentioned that the cushions 5 may be replaced by the guides which are curved logitudinally so as to loosely interfit in the manner shown at 12 in fig. 8. Thereby the sliding cover 7 may be omitted, if preferred.

When the developing has been finished, the tube is removed from the funnel 3, and is bent downwards to discharge the liquid. Then the tube is again applied on the funnel in order that the fixing bath liquid may be filled in through this.

When the exposed and developed films or plates have been fixed, they must be washed, and this is done in the same tank. For this purpose the cover 4 and the lid 7 are removed, and the films which are taken out from the envelopes are suspended in a clip 9, which is provided with yielding cheeks 10, which clip is placed on the upper edge of the tank, as shown on Figs. 5 and 6, after which water is led through the apparatus, by which the tube acts as an overflow, as the upper edge of the funnel is lower than that of the apparatus.

Owing to the wedge-form of the apparatus its volume is much smaller than that of those in general use, so that less quantities of chemicals are employed, and by using film envelopes of the kind referred to, perfect light-tightness during developing may be secured.

It should be mentioned that for the washing of plates there may, in known manner, be used an inner frame or stand instead of the clip 9.

The funnel 3 and the tube 2 need not be outside, but may, both for filling and for washing purposes, be replaced by an inner cross wall with holes near the bottom, or which does not reach entirely down to the bottom, in which case the top edge of the outer wall of the apparatus, which corresponds to the cross wall, is made lower than the other outer walls.—Jens Peter Hensen, 10, Jacob's Allé, Copenhagen, Denmark.

Trade Names and Marks.

APPLICATIONS FOR REGISTRATION.

PERMALYNE.—No. 392,736. Photographic and drawing office prints on linen. Lawes Bros., Ltd., 7-9, Burrup Place, Doris Street, Kennington, London, S.E.11, photographic printers and drawing office stationers. June 26, 1919.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

SATURDAY, SEPTEMBER 27.

Chelsea Photographic Society. Outing: A River Walk.
St. Clements Press Photographic and Rambling Society. Outing to Edgware and High Barnet.
Hackney Photographic Society. Outing to Sewardstone.

MONDAY, SEPTEMBER 29.

South London Photographic Society. "Sketch Portraiture." H. C. Inskeep.

TUESDAY, SEPTEMBER 30.

Leith Amateur Photographic Association. Annual Business Meeting.
Manchester Amateur Photographic Society. Demonstration.

WEDNESDAY, OCTOBER 1.

North Middlesex Photographic Society. "Combination Printing." H. W. Fincham. Special Print Competition: A Street Figure Study.

THURSDAY, OCTOBER 2.

Rodley and District Photographic Society. Monthly Competition: "Fowls."
Hammersmith (Hampshire House) Photographic Society. "Vignettes of J. M. W. Turner, R.A." C. W. Philpot.
Liverpool Amateur Photographic Association. "Through Iceland on Ponyback." Rev. J. A. McIlvoride.

FORTHCOMING EXHIBITIONS.

September 13 to October 11.—London Salon of Photography. Hon. sec., 5a, Pall Mall East, London, W.C.1.

October 13 to November 29.—Royal Photographic Society.—Entries close September 19 (carrier), September 20 (hand). Secretary, J. McIntosh, 35, Russell Square, W.C.1.

A PERSONAL LINK with the past of the British lens-making industry is broken by the death, announced on Wednesday last, of Elizabeth Mary, widow of John Henry Dallmeyer, who died on September 22 at Hampstead, aged seventy-one.

Commercial & Legal Intelligence.

At Chorley County Court, on September 18, David Glazier, photographic artist, trading as D. Henries, of Cheetham Hill, Manchester, sued J. Walton, of Leyland, for £4 10s., the price of an enlargement. Delivery was admitted, but defendant contended that the reproduction was nothing like him. A verdict was given for £3 10s.

Legal Notices.—Notice of intended dividend has been given in the estate of Arthur Aquila Noakes, photographer, residing and carrying on business at 17, St. Peter's Street, Canterbury, and lately carrying on business also at 29a, St. Margaret's Street, Canterbury. Proofs must be lodged on or before October 1 with Mr. J. Osborne Morris, Official Receiver's Office, 68a, Castle Street, Canterbury.

NEW COMPANIES.

Bournemouth Photo Engraving Co., Ltd.—This private company was registered on September 15 with a capital of £2,000 in £1 shares. Objects: To take over the business of photographic engravers carried on at Albert Road, Bournemouth, as the Bournemouth Photo Engraving Co., and to enter into an agreement with R. S. Holditch. The subscribers (each with one share) are: A. W. Evans, 1, Esmond Road, Bedford Park, W.3, journalist; S. L. Barber, 42, Carden Road, Peckham Rye, S.E.15, newspaper manager. The first directors are: Major W. J. B. Evans, Bod Ivan, Llandinam; A. W. Evans, S. L. Barber and R. S. Holditch (293, Wimborne Road, Winton, Bournemouth). Qualification: £1. Secretary: F. H. Harman. Registered office: Observer Chambers, Albert Road, Bournemouth.

News and Notes.

The King and Queen honoured Mr. Vandyk with a special sitting for their photographs at Balmoral.

Beach Photography.—When caught on Blackpool sands with photographs, Arthur Atterbury (photographer) told the constable he was just "trying to earn his fine for to-morrow." He was summoned for the offence at the Police Court, when it was said he had been fined three times for similar offences. He had to pay 40s.—Harry Marks, a travelling photographer, was on September 19 fined 40s. for selling photographs on the foreshore. The Chief Constable said defendant was one of the usual crowd. They knew what they were doing.

Lancashire Society of Master Photographers.—A general meeting of the Society will be held on Tuesday, September 30, at the Queen's Hotel, Promenade, Southport, at 3.30 p.m. The committee will meet on the same day at 2.30 p.m. A social evening will follow the general meeting, and it is hoped that every member of the Society will attend on this day. Ladies are specially invited. Those members who wish to make a full day's outing, and who desire a morning's golf, should communicate immediately with the hon. treasurer, Mr. F. Read, 14, Balfour Road, Southport, who is in charge of the local arrangements.

Mr. Harold E. Marshall, enlargement specialist, of Mansfield Road, Nottingham, has formed a partnership with Mr. Cecil Higson, formerly of the London Photo-Centre, Royal Air Force. Messrs. Marshall and Higson will trade together as Marshall and Company. The firm's price-list of enlarging and other trade work which has just been issued specifies the charges for straightforward enlargements and for water-colours and sketch portraits. A specialty is also made of retouching at photographers' prices. Mr. Marshall has long enjoyed a large measure of appreciation for the excellence and reliability of his trade service, and we have no doubt that the latter will be fully maintained under the extended management.

A City Sale Nutshell Competition.—The City Sale and Exchange announce a competition in which prizes to the total value of £20 will be awarded for the best phrases of four words the initials of which are those, C S A E, of the name of the firm. The "nutshell" phrases are required to express some aspect or opinion of the City Sale's business. There are no entry fees or conditions of any kind except that a competitor may send one entry only and must send it on a form (to be pasted on a postcard), which is obtainable at any of the establishments of the City Sale and Exchange, or is sent post free on request. Sufficient time is allowed for entries from overseas, the last date for Colonial and foreign entries being November 21. The prizes offered are five guineas, three guineas, and two guineas, for the first, second, and third best phrases, together with consolation prizes ranging from 2s. 6d. to 15s.

End of Summer-Time.—The Home Secretary gives notice that summer-time will cease and normal time will be restored at 3 a.m. (summer-time) in the morning of Monday next, September 29, when the clock will be put back to 2 a.m. All railway clocks and clocks in post offices and Government establishments will be put back one hour, and the Government requests the public to put back the time of all clocks and watches by one hour during the night of Sunday-Monday, September 28-29. Employers are particularly recommended to warn all their workers in advance of the change of time.

The public are cautioned that the hands of ordinary striking clocks should not be moved backwards; the change of time should be made by putting forward the hands eleven hours, and allowing the clock to strike fully at each hour, half-hour, and quarter-hour. The hands should not be moved while the clock is striking. An alternative method, in the case of pendulum clocks, is to stop the pendulum for an hour.

Process Instruction in Manchester.—The printing department of the Manchester Municipal College of Technology is now under the direction of Mr. R. B. Fishenden. In addition to courses of instruction in typography, machining, lithographic printing and book-binding, photo-mechanical processes occupy an important position. The department includes provision for theoretical and practical instruction in the various branches of photo-engraving, including the making of line and half-tone blocks, three-colour work, photo-lithography, and photogravure and rotary photogravure. Mr. Fishenden is the lecturer on these photo-mechanical processes and the superintendent of the courses of practical instruction. The work of the department begins on October 6 next, but students are invited to make their arrangements for classes not later than Friday, October 3. A reunion and concert has been arranged to meet old students, members, and other craftsmen returned from war service and will be held at the College on Saturday evening, September 27. Those desirous of taking part in this function should communicate with Mr. Fishenden without delay.

Photographic Classes at Manchester.—We have received the prospectus of the part-time classes in the department of photographic technology of the Manchester Municipal College of Technology. The classes in this department, of which Mr. Charles W. Gamble, O.B.E., late R.A.F., is the head, are arranged to provide a systematic course of instruction in the principles and practice of photography extending over three years; but special classes may be attended by arrangement with the head of the department. Two fully equipped photographic studios are available for instruction and practice in portraiture by daylight and artificial light, and the department also includes a cinematograph studio for experimental work, a photo printing room, and a well-equipped laboratory for research work. Fees for individual classes are 12s. 6d., one night a week, but a great reduction in fees is made when a student takes three or more classes in the course of each week. The session opens on October 6, but intending students should enrol themselves during the week beginning Monday next, September 29. There must be many of our readers within easy access of the Manchester College to whom these courses of instruction provide a most valuable means for systematic and intelligent study of photographic theory and practice.

Inter-club Competition.—Keen interest has been aroused by the Photographic inter-club competition for the "Toulmin" Silver Shield, taken part in this year by fifteen societies, chiefly in Lancashire. The president of the Alliance is Mr. J. Hey, of Colne, and the secretary Mr. A. Clayton, of Blackburn. Darwen Society have again carried off the shield in the print section, this being the third successive year. Preston Pictorial and Chorley Photographic have also been winners on three occasions, but not successively. Mr. Alex. Keighley, F.R.P.S., of Steeton, was the judge. Darwen this year have gained 72 marks, Blackburn coming second with 67, and Nelson

and Preston C.C. following with 63 marks each. The following are the awards:—

Club.	Print.	Mount.	Marks.
Darwen P. S	45	27	72
Blackburn C. C.	40	27	67
Nelson C. C.	37	26	63
Preston C. C.	38	25	63
Nelson P. S.	37	25	62
Colne C. C.	33	27	60
Horwich A. P. S.	34	21	55
Todmorden P. S.	26	26	52
Preston Scientific Society	16	25	41

Special prize, best print, Mr. R. Berry, Horwich.

In the slide competition, for which the trophy is the Clayton Rose Bowl, Colne C.C. beat Darwen by 55 points to 53. The slides were judged by Mr. Jas. Shaw, F.R.P.S., of Manchester, whose awards were:—

	Marks.
Colne C.C.	55
Darwen P.A.	53
Mechanics' C.C., Burnley	52
Preston Scientific Society	46
Preston C.C.	45
Nelson C.C.	43
Todmorden P.S.	37
Blackburn C.C.	29

The eleventh annual exhibition of the Alliance is being held at Colne Free Library on October 4.

The special prize for the best slide was won by Mr. T. Plews, of Nelson C.C.

British Lens Makers.—A very sweeping statement disparaging British lenses in comparison with those of Germany and Austria having recently been made in *The Times* by Sir Robert Hadfield, Messrs. Ross, Limited, in a letter which appeared in *The Times* on September 18 last have very properly challenged the views of Sir Robert Hadfield, and have asked for information as to the expert opinion which prompted his statement. We reprint portions of Messrs. Ross's letter:—

"In *The Times* of September 11, under the report of the 'British Association' and the heading of 'Glass-Makers' Ordeal,' you gave publicity to some remarks by Sir Robert Hadfield, which in the interest of the British optical industry, must not pass unchallenged. Sir Robert said:—

"'He regretted that we were still dependent on Germany and Austria for lenses of the best quality. His expert friends told him that we still had to go abroad for the best lenses, and the best lenses in his own works were of foreign make. He had given the English makers every chance to submit lenses of equivalent quality, but without a really satisfactory result.'

"If these remarks were strictly true, one could only accuse Sir Robert of lack of wisdom in providing our German competitors with an unsolicited testimonial. There is, however, evidence ready to hand which proves conclusively that the facts are not as stated, and therefore one must assume that Sir Robert has been somewhat unfortunate in his choice of expert friends, or that he has not consulted enough of them.

"Captain C. G. Hetherington, R.A.F., Photographic Section, in a letter to the *Photographic Dealer*, says:—

"'With regard to the question of superiority of British lenses, I feel a statement upon this point will be of interest to the photographic trade generally. Practically all the lenses used in the R.A.F. for aerial photography have been designed in England during the war for this special purpose.

"'From fair comparative tests which have been made these have been found to be superior to any enemy lenses, including those of Zeiss and Goerz, which have been used in the German Air Service. That is a fact. I am not talking sentiment.'

"Surely these opinions are sufficient evidence of the trend of general opinion. Possibly Sir Robert refers to a particular type of lens used for some special purpose, and it is conceivable that such a lens might not yet have been manufactured in this country with the same success as in Germany, but this does not by any means justify so sweeping a statement as Sir Robert makes. Speaking of the lens industry as a whole, we have undoubtedly not only caught up the German manufacturer, but have in many cases surpassed him.

"It would, at any rate, be interesting to know the source of the expert advice which has led Sir Robert Hadfield to make this statement, which can be nothing else but injurious to the British optical industry."

Correspondence.

**** Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

**** We do not undertake responsibility for the opinions expressed by our correspondents.*

NATURAL COLOUR PHOTOGRAPHY.

To the Editors.

Gentlemen,—My attention has been called to an article in your columns on the above subject. I would like to mention that I am also interested in a process of colour photography, apparently in every way similar to that described in your article. I notice, however, the date of the patent application for the process described in your columns is given as January, 1919, whereas my process is patented as and from March, 1918, nearly twelve months previously. This specification also describes the taking of pictures without the use of colour-screens. I may add that the process has been proved a success, and in a short time, I hope, will be on the market entirely with the aid of British capital.—Yours faithfully,

London, W.C.1. J. Salter.

EYEGLASS FOCUSSING MAGNIFIERS.

To the Editors.

Gentlemen,—My point is that "Bifocal" is not getting what he thinks he is—i.e., an image of the same subject on the fovea of each eye at the same moment—for it is incredible to me that anyone not suffering from bilateral convergent strabismus of a most pronounced type could do this at a distance of 3 in. It must be very painful, even if possible, to anyone else!

It may be worth while having spectacles made as he suggests—I do not know, and should hardly think so; but they will not give binocular vision.—Yours truly,

Travers J. Briant.

Beverley, Epsom, September 20, 1919.

To the Editors.

Gentlemen,—I think "Bifocal" must be in error with regard to his bifocals. Either they are not so powerful as he thinks, or else he does not get binocular vision. It is easy to see that to maintain single binocular vision with lenses having a focal length of "under three inches" it is necessary to converge each eye about 25 degrees.

If they are really of that power, it is more likely that he is using one eye only, and mentally suppressing the image given by the other—a habit quite easy to acquire.

The best advice I can suggest to anyone who wishes to follow "Bifocal's" advice is to explain the requirements to an optician and be fitted with the most powerful lower segments possible, consistent with maintaining single binocular vision.

If "Bifocal" cares to send me his lenses through the Editors I would tell him their power and return them immediately.—Yours faithfully,

A. G. Williamson, F.S.M.C.

37, Hinstock Road, Plumstead, S.E.
September 22.

A COMMON CAUSE OF LOSS OF BUSINESS.

To the Editors.

Gentlemen,—In my observation, one of the commonest causes of loss of custom by photographers is unreasonable delay in the execution of orders. At an establishment employing about a dozen hands that I visited some two or three years ago the proprietor showed me letters of bitter complaint and angry reproach from customers whose orders had been in arrear for some time, and he told me that he was receiving such letters nearly every day, and did not know how to remedy it. I then explained the plan which I had followed in my own business, and he at once adopted it, together with a reorganisation of the printing arrangements.

Down the centre of the page in the day-book a line is ruled in red ink across each order as it is despatched to the customer. When all orders on the page are completed, the line is continuous from top to bottom. Turning back a few pages, any break in the line shows that immediate attention is required.

The printer's order book is treated similarly, except that a pencil line is here considered sufficient.

W. E. Debenham.

AMATEURS' FILM SPOOLS.

To the Editors.

Gentlemen,—I have been particularly impressed this summer by the number of amateur customers who have come into my business with spools of film which have not been the right size for their cameras. It seems such a pity if a photographer or chemist lays himself out to cater for amateurs at all that he does not take particular care to teach his assistants the different sizes, and make them note the name and size of cameras brought in. Only to-day I had a young man bring in his camera who said he had been *winding off* the film from the spool he had purchased on to another spool to fit his camera. I told him he must have been supplied wrongly, and he said he got the spool at a local chemist and was served by a "bit of a young girl." I found his camera was a No. 2 Ensignette, and he had been supplied with a V.P.K. spool. I may say that my assistants have been so drilled on sizes that they rarely give a wrong spool, and if in doubt always go to me or a senior assistant. Even my "bit of a girl," though only 15, has been thoroughly taught. It is really quite easy to master the sizes if one will only exercise one's memory. The mention of a size immediately suggests the *number* on the spool, viz., 3¼ × 2¼ suggests No. 120 or 105. There is only to find out if the camera is a No. 2 Brownie or a No. 1 F.P.K., and then the proper film is easy enough to find. I don't think photographers realise that amateurs are at all profitable if properly catered for. I find that amateurs very often know quite as much as professionals, and also a great many films and plates are spoilt in developing carelessly done. To my mind, if this branch is worth doing at all it should be done properly, and not pushed off with "Oh, it's only an amateur, *they* won't know." Some amateurs are very stupid, of course, but most of them are only so because the people they buy cameras from won't trouble to show them how to use it, or take any interest in them.—Yours faithfully,

Alice O. Yardley.

197-198, High Street, Gorleston-on-Sea.

THE "CROYDON" HECTOGRAPH.

To the Editors.

Gentlemen,—Although the hectograph, strictly speaking, is not a true photographic article, particulars of it may legitimately find a place in your columns because of its usefulness to secretaries of photographic societies, and your Croydon reporter is to be congratulated upon his helpful report and, further, upon spelling the name of the article as he has done, for the word "hektograph," commonly used, is a very ugly one. Some may argue that the latter is the more correct, but in my humble opinion both are very unfortunate names for an article that fails to give one hundred copies, as either name leads one to believe it to do.

Hectographs, or "jelly-copiers," of the ordinary type are composed of gelatine and glycerine, with a preservative—usually oil of cloves; but the golden syrup Mr. Purkis gives in place of glycerine is a decided improvement. One has an idea, somehow, that golden syrup was used in place of glycerine because of the scarceness and high price of the latter during the war. Be that as it may, I feel sure that makers of a hectograph will find syrup to be very much better than glycerine.

One hears complaints sometimes about the discoloration of the jelly owing to the absorption of the dye-ink, which can never be cleared off properly. The way to get rid of the discoloration and to clear the jelly is to remelt over a slow fire or in a warm oven, and then stir in a little dried whiting; the latter appears to take up the dye and settle at the bottom, leaving the jelly-bed fairly clear.

I wish your Croydon reporter had not dealt with inks so briefly, as inks are most important. The best black ink I have used is to mix 1 oz. methylated spirit, 1 oz. water, 2 oz. glycerine, 60 gr. aniline black (soluble in water), and warm and stir till the colour is quite dissolved; for other colours use a suitable aniline dye in place of the black. I am, however, grateful to your correspondent for the methyl violet ink formula, which I hope to use, having failed, so far, to get a good home-made violet preparation, in spite of the many formulæ that have been published.—Yours faithfully,

L. T. Woods.

PHOTOGRAPHERS AND THE SALE OF POSTCARDS.

To the Editors.

Gentlemen,—Christmas is drawing near and photographers throughout the country, having finished their summer trade, are looking for something to liven them up during the winter months.

The real-photo postcard trade is with many photographers a "side line," because they look upon the 2d. or 3d. postcard as *infra dig.* in comparison with their high-class studio work, and they leave it to the local stationer. This may be quite good in a way, but most photographers have among their negatives—hidden away—numbers of interesting subjects—local views, churches, country houses, portraits of local celebrities, clergy, warriors, public men, pretty children—in fact, there is no end to the variety of subjects which a country photographer has on his shelves, which during the busy season he has not had time to even look at. These subjects are not generally known to the stationer who buys from the postcard publisher's stocks, and as these stocks are produced in large quantities the number per negative is more than the publisher can afford to purchase, owing to the limited sale of such pictures.

If the photographer would look out these negatives, and if he has no time or convenience to print them in his own studios, send them to a trade printer, order, say, 1 gross of each subject, and exhibit in his window a sample of each subject nicely mounted on a show-card with suitable artistic wording, I venture to say that he would create a profitable trade and bring customers into his studio for other work. If he orders from a trade printer the cost of one gross per subject is 16s., and he sells at 2d. or 3d. each. This makes a profit of 50 per cent. to 125 per cent. on outlay without risk of heavy stock. This cannot be done by the stationer, who has not the negatives.

I should like you to find space for this letter in order to bring home to the photographer the possibilities of increasing his prospects without any trouble to himself or employees, as apart from profit on sales, he would advertise his business.

I can hear the following drawing-room conversation:—

"Mr. Enterprise has some beautiful postcards of ———— in his window, let us buy them for Christmas cards. I will call and ask what he would charge to take our house and do a hundred or two postcards. They are awfully good."

Then the photographer gets an additional order.—Yours faithfully,

Philip G. Hunt.

332, Balham High Road, London, S.W.17.

September 23.

SELECTIVE REDUCTION WITH BICHROMATE.

To the Editors.

Gentlemen,—Some years ago I made a series of experiments with bichromate-hydrochloric, both as a reducer and an intensifier. Unfortunately my notes on this subject are all abroad at present, but your article on reducing (p. 539 of September 12) reminds me of the subject.

So far as my memory serves me, I used a solution composed as follows:—

Potassium bichromate	10 gms.
Water	1,000 ccs.
Hydrochloric acid	2 or 3 drops

I wished to get more contrast in an over-dense negative and to reduce the shadows. If a negative is immersed in the above solution it will be noticed that the bleaching takes place evenly downwards, the thinner part, i.e., shadows, being the first to be entirely pene-

Fig. 1.

trated and finally the high-lights, the reason being that the thickness of the silver deposit is greater in the high-lights than in the shadows. The diagram (fig. 1) will assist in making my meaning more clear. It is an enlarged section of which the shaded portion represents the silver deposit of the negative. The bleaching will have passed successively through the layers 1, 2, 3, 4, 5, 6. If, however, the bleaching is stopped when it penetrates to layer 3, it follows that down to layer 3 the silver will have been transformed into a chloride which is soluble in hypo, and the remaining layers, 4, 5, and 6, will be insoluble silver and not affected by the hypo (fig. 2).

Fig. 2.

If at this stage the partly bleached negative is washed well and then put into hypo all the silver in layers 1 to 3 will be dissolved out and the remainder, 4, 5, 6, be unchanged, i.e., the high-lights slightly reduced in density will remain, also part of the shadows, and the result will be a more brilliant negative as in fig. 2. If, on the contrary, I wish to decrease the contrast in a negative, I bleach the negative entirely through, then wash it well and re-develop it with a weak metol-hydroquinone developer. Now the re-development takes place exactly in the same way as the bleaching, i.e., penetrating evenly downwards by layers, so that if I re-develop down to No. 4 layer fig. 3 will be the result. If now I put this into the hypo,

Fig. 3.

layers 1 to 4 will remain insoluble, and layers 5 and 6, being soluble chloride, will be dissolved out. The negative will therefore have less contrast. The operation should be carried out in the dark-room, as the bleached negative is sensitive to light. It is as well to experiment on some old negatives, as it is somewhat difficult to judge the exact amount of bleaching.

Trusting this will be of use to some of your readers, yours, faithfully,

E. G. SIMPSON.

7, Clinton Hill, Dormans, near Lingfield, Surrey, Sept. 13.

Answers to Correspondents.

SPECIAL NOTICE.

In consequence of general reduced supplies of paper, as the result of prohibition of the importation of much wood pulp and grass, a smaller space will be available until further notice for replies to correspondents.

Moreover, we will answer by post if stamped and addressed envelope is enclosed for reply: 5-cent. International Coupon, from readers abroad.

The full questions and answers will be printed only in the case of inquiries of general interest.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

E. H.—We think you come under the Retail Businesses Licensing Order, and require to apply to the regional headquarters at Iddesleigh Mansions, Westminster, London, S.W.1.

T. AND CO.—The query is too general to be answered briefly. You will probably find all the information you require on fitting half-watts in an article which appeared in the "B.J." of October 26, 1917, which our publishers can supply price 4½d. post free.

H. W.—No licence for the business you mention is required in either case, presuming that the business is carried on in such a way that the general public in the neighbourhood will not be able to discover it in the way that they can discover goods for sale in an ordinary shop. If the business offers work to the public as a shop offers goods, then we think we think it comes within the Retail Businesses Order, and in that case you require to have a licence.

W. T.—Gaslight prints are quite as permanent as bromide prints. In the case of either paper the warm tints obtained by development are not as permanent, in our opinion, as the ordinary black tone. A silver image obtained in the more finely divided state which represents a warm colour is, as a rule, more susceptible to the action of damp, gas fumes, etc., than is the coarser black image. On the other hand, a print which is toned by bleaching and passing through a sulphide bath is more permanent than a black print.

A. E.—The bracket in your studio has probably been placed there to support an enclosed arc lamp, and would be of little use for half-watt lamps which require to be distributed to give the best effect. It is much better to have them to raise and lower. Each lamp will require a reflector and diffuser, or you might arrange a thin calico curtain in front of them all with an opaque reflector, dark on the camera side and white towards the lamps. These could be hung on rods not too near the globes, or the material will be scorched.

N. W.—It is possible that under the Retail Businesses Licensing Order you require a licence for starting a business which has been suspended, but bear in mind that the Order is made for the purpose of protecting men like yourself who have been in the Services, and whose businesses have been temporarily closed on that account. You should have no difficulty in obtaining a licence to re-start in the present premises, and equally if you move the business to another address. You should apply to the regional licensing headquarters at 5a, Union Street, Bristol.

M. N.—We think you refer to the paragraph on p. 262 of the "B.J." of May 18, 1917, contained in an article on washing, by A. W. Warwick, where it is stated that an osmotic pressure of 210 lb. per square inch is produced when a hypo-saturated film is placed in water. We are sorry we are not able to say whether such a figure is approximately correct. Without professing to know very much of the physics of surface tension or osmosis phenomena,

we should doubt whether your theory of pinholes being caused by disruption of the film through air-bubbles on it during washing accounts for the effects.

V. C.—Most Press photographers use a plate not of the very maximum speed, but one such as Imperial Special Rapid, although an ultra-rapid plate, such as Ilford Monarch or Marion Record, will be used as occasion requires. For such quick movement as is met with in ordinary street scenes and functions apart from sporting subjects, 1-50th second is as rapid a shutter exposure as is ever necessary, usually a very much slower speed is all that is required. The best place at which to have your shutter tested is the National Physical Laboratory, Teddington. A good developer for strong negatives is the Imperial pyro-metol.

A. S.—There are several text-books of collotype, but we think the only one in print is "Photo-Mechanical Processes," by W. T. Wilkinson, price 4s., from Messrs. Hamptons, Cursitor Street, London, E.C.4, which deals also with other photo-mechanical methods. Apparatus such as drying ovens and presses are supplied by Messrs. A. W. Penrose and Co., Ltd., 109, Farringdon Road, London, E.C.1. No book instruction would enable anyone quite inexperienced to learn the process; he would require a course of practical instruction, the best place for which is the L.C.C. School of Photo-Engraving, Bolt Court, Fleet Street, London, E.C.

J. R.—As you have sketched your diffusing screen at right angles to the background and 6 ft. away, it would seem that you would waste a good deal of light and, what is worse, have a glare between lens and sitter. To get the greatest advantage with these lamps it is desirable to arrange them slantingly across the studio, one being nearly in the middle about 8 ft. high and 8 ft. from background and the others in a curve to one side, the two ends being rather lower, say 6 ft. from floor. If you decide to keep to your sketch we should place the four lamps in pairs, two 8 ft. high and 4 ft. apart and two 6 ft. high and 3 ft. apart, these two being rather nearer the sitter's end of the screen.

O. P. C.—Water-soluble Nigrosine can be obtained from any of the merchants in fine chemicals, such as Messrs. Harrington Bros., 4, Oliver's Yard, City Road, London, E.C., price about 1s. 6d. per ounce. About the best preparation for backing is a mixture of caramel brown or black pigment, such as burnt sienna or vegetable black, gum syrup, and methylated spirits. The caramel should be the special kind made by Lichtenstein, for backing, and can be obtained from dealers in photographic chemicals, such as Messrs. Johnson and Sons, 23, Cross Street, Finsbury, London, E.C. For ordinary plates the reddish pigment, such as burnt sienna, can be used, but for colour-sensitive plates it is better to use a black pigment. Simply dissolve the caramel in the minimum quantity of water thickened with the strong gum solution, and add enough spirit to make the mixture quick drying.

T. G.—To secure short exposures and soft even lighting you will require about three 1,000 c.p. half-watt lamps. These may be conveniently fitted in a curve, the first being opposite the centre of the background about 8 ft. from the ground, the others generally approaching the side of the studio, that nearest the background being rather lower, say, 6 ft. from the ground. If possible make them all to raise and lower, as this will enable you to make shorter exposures with sitting figures and children. Each lamp should have its own reflector and diffuser and work from a separate switch, thus obtaining full control of the lighting and economy of current. A round head screen and a reflector of the usual type are all the appliances required. You should make sure that your current is actually of the voltage it is supposed to be, as running the lamps even slightly under their full voltage will cause a considerable loss of actinic power.

F. D.—With regard to cost of half-watt installations, we regret we cannot give you any precise estimate, as the prices fluctuate very much just now. There has been an increase of 50 per cent. plus 25 per cent. during the current year on some lines, but we do not think that the lamps themselves have risen to this extent. If you write to the General Electric Company, Ltd., 67, Queen Victoria Street, London, E.C., stating your exact requirements they will send you an estimate which would probably hold good for a few days. We cannot advise you with regard to the wiring, as we do not know the capacity of your leads nor the voltage of your supply. Your local electrician will be best able to judge. If your place is only wired for a few lamps, heavier leads will probably be necessary, but this should not be expensive to instal. At present portable studios are fetching about three times pre-war prices, so that we should advise you to use the room which would also be more comfortable in winter.

Rex.—For enlarging a 6 × 5 negative three diameters, that is to 18 × 15, with a 7in. lens, the space required between the negative and the paper is just under 3 feet, so that you have plenty of room within your 6ft. space for the lantern body. For enlarging smaller negatives up to 15 × 12 you would require more space, but allowing 18 inches for the lantern body and the support of the easel, you could still enlarge 6 diameters with the 7in. lens, that is to say you could enlarge to 15 × 12 from negatives as small as about 2½ × 2 inches. One of the best models of enlarging lantern is the chain and sprocket model of Butcher's. As regards light, apart from ordinary central draught oil lamps (which would be very difficult to fit to the ordinary lantern body) the only lamp is the "Luna" incandescent mantle lamp of W. C. Hughes and Co., 82, Mortimer Road, Kingsland, N.1., burning methylated spirit. In hot weather it will make such a very small dark-room uncomfortably warm, we think, but otherwise is an excellent lamp.

Sensitizing Canvas.—I should be obliged if you could tell me where, or how, I could get enlargements from my own negatives lightly printed on my own canvases. Any rough indications of the subjects would suffice as long as they saved (sometimes difficult) drawing, placing, etc., of such details as jewellery on the work. I imagine that such a thing as a bromide solution might be lightly brushed on the required spot, and be developed and fixed with a large, soft brush, sufficiently plain to work on. Some particulars of this might be of interest to many "B.J." readers. —Alfd. J. N. Goodson.

A process of sensitising canvas for enlarging is what you want, and was much used years ago before bromide paper became so largely used in the cheap enlargement trade. We gave a large number of these sensitising formulæ in the "B.J." of August 25, 1916 (price 4½d. post free from our publishers). No doubt you can work the process yourself if you have facilities for enlarging with arc light, or even a light of lower power if you are content with mere outline sketches.

The British Journal of Photography.

Line Advertisements.

Charges for Insertion.

Since advertisements cannot be inserted until fully and correctly prepaid, senders of line announcements are asked to bear in mind the scale of charges. They will thus save themselves delay in the publication of their announcements. A Schedule by which an advertisement can be correctly priced will be sent on request.

Net Prepaid Line Advertisements.

12 words or less 1/-
Extra words ... ... 1d. per word.
(No reduction for a series.)

Special Note. Box Number Advertisements.

"Box No." and office address ... ... charged as 6 words.
For forwarding replies add ... 6d. per insertion for each adv't.
If replies are called for this latter charge is not made.

Advertisements cannot be inserted until fully and correctly prepaid.

Orders to repeat an advertisement must be accompanied by the advertisement as previously printed.

Advertisements are not accepted over the telephone or by telegram.

The latest time for receiving small line advertisements is 12 o'clock (noon) on Wednesdays for the current week's issue.

Displayed Adv'ts should reach the Publishers on Monday morning.

The insertion of an Advertisement in any definite issue cannot be guaranteed.

HENRY GREENWOOD & CO., Ltd., Publishers,
24, Wellington Street, Strand, LONDON, W.C. 2.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3100. Vol. LXVI. FRIDAY, OCTOBER 3, 1919. Price Twopence.

Contents.

	Page
Ex-Cathedra	573
Dampness and Faded Prints	574
Efficiency in the Workroom. By Herbert G. Stokes	575
Practicus in the Studio. By Practicus	577
Patent News	578
Meetings of Societies	578
Commercial and Legal Intelligence	579
Correspondence— Hypo-Alum v. Sulphide Toning—British Lens Makers	579
Answers to Correspondents	580

SUMMARY.

In consequence of the railway strike, and as a precautionary measure towards attempting to ensure regular publication, a number of articles, paragraphs, etc., are held over.

The first instalment of a paper, read before an American Convention by Mr. Herbert G. Stokes, deals with various time-saving devices in photographers' work-rooms and includes (this week) general arrangement of a printing-enlarging room, making of multiple vignette prints and introducing diffused focus into prints from normal negatives. (P 575.)

In a leading article we describe the effects noticed as regards fading in a batch of prints which by accident had been stored for about a year in a very damp place. Platinum prints were the only ones which were absolutely unchanged. (P. 574.)

In his article this week "Practicus" deals with the photography of wedding groups. He gives hints on the general arrangement of the figures, selection of background, development, and on the style of mounting most generally preferred. (P. 577.)

An aid to writing titles on negatives so that the letters are reversed as regards right and left is provided by the hectograph method of duplicating copies. (P. 574.)

The making of diagram enlargements for school use is a branch of work for which in some places a demand may be created. (P. 573.)

Protective coatings for dishes require to be selected in reference to the solutions which are being used. Shellac varnish is unsuitable for any solution, such as a developer, which is strongly alkaline. (P. 574.)

"Colour Photography" Supplement.

MM. A. and L. Lumière and A. Seyewetz communicate a simplified method for the development of Autochrome plates. It is a method based on the observation of the time of appearance of the image in a diluted developer, the plate being transferred to a stronger solution as soon as the image has appeared. The dilution of the first and second developer is adjusted so that the plate is developed in the second for the same time as was required for the image to appear in the first. (P. 37.)

Details are given in a recent specification of Mr. F. E. Ives of a method of producing two-colour prints or films, a salient feature of which is the combination of a red copper-toned silver image with one of blue-green colour, preferably formed by means of iron toning. (P. 38.)

Some practical hints on the use of colour-screen plates refer to exposure and to the somewhat different requirements in this respect of the Autochrome and Paget plates. (P. 40.)

Mr. E. G. Handel-Lucas, writing on the future of three-colour photography, urges that a return is necessary to its first principles, and also that consideration deserves to be given to the incorporation in any three-colour system of working of a key-plate in black or grey corresponding with an alleged perception of neutral tone differences by the eye. (P. 39.)

EX CATHEDRA.

Mixed Lighting. Now that the days are becoming appreciably shorter, those photographers who have suitably arranged artificial lights will find a considerable advantage in using them to supplement poor daylight. In many cases this is not possible, as the lamps are fixed on the solid side of the studio to avoid interference with the working of the blinds, but if there happens to be a lamp fitted to a movable stand or pedestal it can easily be moved into a position where it will give the necessary "snap" to the lighting. Used in this way, it allows of the figure being lighted rather flatly by opening the blinds to almost their full extent, the electric lamp being used for the production of high lights. A few experiments will probably be necessary to hit the correct exposure, since there is hardly any form of artificial light which is exactly the same colour as daylight, the enclosed arc appearing bluer and the nitrogen-filled lamps more yellow. In any case the difference in lighting will not be great, even if the colour be not allowed for. This expedient has in some hands proved very useful for child portraiture in the winter, even when the daylight was fairly good, as it allowed of much shorter exposures being made than was possible with either light used alone.

* * *

Enlarged Diagrams. We recently saw a number of diagrams which a teacher had enlarged upon bromide paper to a uniform size of 20 x 16. He said that their preparation had saved an enormous amount of blackboard work, and, being sharper and more accurate, were much better for the purpose of instruction. This would seem a class of work that photographers who make their own enlargements might profitably take up. The negatives should be made upon process plates, and if carefully exposed and fully developed will need no intensification. A slow bromide paper and well-restrained developer should be used to ensure good clean lines. Any slight deposit on the whites can easily be cleared off with Farmer's reducer or iodine and cyanide solution. The photographer's work might end here, leaving the mounting on calico or board to the teacher. In order to keep the surfaces clean—no easy task in a school—the prints should receive a coating of clear "paper varnish," such as is used for wall decoration, this also serving to prevent sulphurisation. If any colouring is needed it can easily be done before varnishing, and as there is already a coating of gelatine no sizing is needed. This method might also be extended to the reproduction of tables of figures, where hand copying would necessitate great care and require checking by an expert.

Stale Solutions. Many otherwise inexplicable variations in the quality of negatives and prints may be traced to the use of stale chemical solutions. We recently came across a bottle of concentrated pyro solution made about three months previously. The usual preservatives, sulphite of soda and metabisulphite of potass, had been used, but the developer worked very slowly, and after double the usual time of immersion the image was still too thin to yield a good print. As an experiment double the quantity of pyro solution was put in to the same quantity of water as in the first trial. This developer yielded quite a satisfactory negative in the usual time. Shortly after this a friend showed us a bottle of a well-known single-solution developer which had been left uncorked for over two months. It had turned very dark and somewhat turbid. Upon trial it worked much more slowly than it usually did when diluted to the normal extent, but upon adding about 50 per cent. more of the concentrated solution it behaved in its usual manner. It is perhaps not often that it is necessary to use stale developer, but if one is in that position it is useful to remember that the difficulty may usually be surmounted by using rather more of the stock solutions. Of course, if a developer made up to working strength has deteriorated there is no other course than to use a liberal quantity and give a prolonged development. If this fails, nothing else can be done but to make up fresh solutions.

* * *

Coatings for Dishes. The high prices now charged for large dishes in vulcanite, enamelled iron, or porcelain have caused attention to be directed to substitutes made of wood. These, of course, require some coating to render them non-absorbent of the solutions used, and many recipes have been given for this. It is obvious that the purpose for which the dish is to be used must be taken into consideration, as coatings which are quite suitable for one class of solution may be soluble in another. Shellac varnish is often recommended, and is quite useful for washing-trays or with solutions having an acid reaction. It could, for example, be used for developing enlargements with amidol to which a little metabisulphite has been added, but not with a metol-hydroquinone developer, which contains enough alkali to soften and ultimately to dissolve the coating. One of the best methods of lining a dish is to use brown linen holland, which should be carefully glued in. When quite dry, paraffin wax is applied by means of a hot flat-iron, taking care to saturate the fabric and to fill any creases in the corners. This will resist any solution likely to be used in photography, and as soon as any sign of wear appears a cake of wax and a hot iron will give the dish a new lease of life.

* * *

Transferring Titles. Few people who have not been trained as lithographers have the knack of lettering in a reversed position, and we frequently see postcards and other prints which are spoiled by having a clumsy, ill-written title printed upon them. Those who wish to make neat titles may borrow a useful hint from Mr. Purkis's recent lecture at the Croydon Camera Club. The negative film when wet is very receptive of aniline dyes, or even of ordinary copying ink. All that is necessary is to draw the lettering carefully upon very hard paper with a pen and ordinary violet or red ink. As no copies are required the thick hektograph ink is not necessary; indeed, it is best not to use it, as it may spread in the film. While the ink is drying the negative is well damped until the film is swelled in the desired spot, after which the written title is laid upon it face down, and gently rubbed into contact. It should be left for about half a minute and then stripped off, when the title will be found to be clearly impressed upon the gelatine. It will be too faint to print as white, but it can, when dry, be traced over with opaque. It will often be found that after this has been done a few times the appearance of reversed letters will be sufficiently familiar to allow the work to be done directly, that is, without the aid of the transfer.

DAMPNESS AND FADED PRINTS.

That there are so many different views held as to the relative permanency of photographic prints is probably due not only to variation in the methods by which the prints have been made, but to the conditions under which they have been kept. When both sets of conditions are favourable a fairly high degree of permanence may be obtained even with silver images, while on the other hand a few weeks or months at most may witness the almost complete destruction of the image.

Leaving out of the question chemical vapours such as might be found in a laboratory, iodine, chlorine, or sulphurous acid, it would seem that there are two main features in the destruction of an ordinary photograph, the sulphurous vapours usually present in town atmospheres and dampness.

We have lately had an interesting demonstration of the action of damp by the discovery of a large number of photographs, embracing examples of nearly all the processes in common use, which had been stored in a cupboard presumed to be dry, but which by the unsuspected leakage of a pipe embedded in the wall was extremely damp at one side. The photographs were of all ages; some albumen prints made over thirty years ago; bromides of all ages from thirty years to three months; some P.O.P. and collodion prints of all dates, as well as a few carbon platinum prints and some three-colour process proofs —all were in this collection. It may be as well to say that, in spite of their age, all the prints were in fairly good condition when stowed away a little more than a year ago. The deterioration, which has in most cases been utterly destructive, is clearly due to the damp atmosphere. The albumenised prints have faded from a good purple to a yellowish brown, the paper also yellowing. The bromides, originally brilliant specimens, have in the case of untoned prints faded almost away, while sulphide-toned ones have lost much of their strength. Prints on collodion papers have faded badly, showing a spottiness not present in the bromides. Only platinum prints were absolutely unchanged. In some cases mildew has formed upon the surface, but when this was removed the image, as was to be expected, was perfectly good. Carbon prints have stood well, except that where mildew has appeared the surface of the gelatine has been spoiled. A curious effect was observable in the prints from three-colour blocks; in some cases the red printing colour had, through the action of the damp, diffused itself all over the surface of the picture, and in some cases through to the back of the paper.

As a contrast to this we have prints made under similar conditions which have been kept in dry cupboards in a gas-lighted stove-heated room which have endured wonderfully well.

It is thus seen, then, that damp is a most potent factor in the fading of prints, and every precaution should be taken to secure silver images from it. In the case of framed pictures it is of little use to paste up the backs of the frames as long as the cardboard and wooden back remain porous and permeable to the atmosphere. It would seem that the safest treatment, as far as permanency is concerned, is to dry-mount the prints with a good shellac

tissue, and to coat the faces either with a varnish or to rub them with a good encaustic paste.

It must not be overlooked that although toned bromide prints have suffered from their severe ordeal they have not done so to the same extent as the black and white ones. In the case of the albumen prints, those toned to a purple have been found to fade less than those of a brown colour.

No oil-prints or Bromoils were submitted to this involuntary test, but it is to be presumed that they would have stood it as well as a few collotypes which had retained their original freshness. The moral which the professional photographer may draw from this experience is that it is very desirable to keep all showcases and window enclosures well ventilated in damp weather, and that in the case of pictures hanging upon outside walls a couple of corks or studs should be placed at the lower corners of the frame, so as to allow of a current of air passing between the wall and the picture.

EFFICIENCY IN THE WORKROOM.

There are too many photographers to-day who pay insufficient attention to workroom efficiency. Some kind of system has to be observed in the office and reception room, but so long as the photographs come through eventually, little thought is given to the methods employed in the workroom.

The processes necessary to the correct evolution of a picture from dark-room to client are so many, and our opportunities for increasing the efficiency of working conditions are correspondingly numerous.

In producing photographs—whether in large or small quantities—in "popular price" work, or work of the highest artistic value, system, applied to the methods employed, will be found a wonderful asset to every photographer who strives after success.

No business can derive a maximum benefit without it, and the more this efficiency is incorporated in our workrooms to-day, the greater will become the capacity of those studios, their output will be larger and better, and an all-round improvement will be the result.

I am not propounding something new. Everyone of us realises the obvious truth of these facts, yet how many of us apply them to the everyday routine of a modern studio?

I am talking to you to-day against my own inclinations. I realise that I could learn from so many of you here much more than I am able to teach. But those in authority at this convention have been good enough to consider that our workrooms are conducted on a system which is helpful, and also that we have in those workrooms a few original ideas which ought to be spread broadcast among photographers, hence my appearance here.

I have no doubt that before this convention is over I shall find that my original ideas are also subjected to that old

Fig. 1.—Efficient arrangement of printing and enlarging room.

saying, "There's nothing new under the sun." But my efforts are simply directed towards showing what big time-savers and efficiency-makers I have found these ideas to be, and it's immaterial who discovered them.

My first illustration shows the relative position of the important apparatus in the printing room (Fig. 1). Before I proceed further, let me suggest that if we spent more conscientious thought on the arrangement and conveniences of the printing room, 50 per cent. of the photographer's troubles would be automatically removed. I have heard it repeatedly asserted by men who ought to know, that a good printer is as important an asset as any man in the studio; if this be so, then the room he works in should be treated with equal importance.

The old fallacy that a printing room must necessarily be a dark-room has long since been exploded. Plenty of light is permissible, provided it is safe light, and with light, cleanliness will become an easier accomplishment.

To return to my illustration of the printing room. Emphasis ought to be laid on the fact that there is little or no lost motion, that each consecutive process follows the other in direction as well as order. The shelves for storing paper and the cutting bench comes first, then the printing machine with negatives in order above it—negatives for enlarging, negatives for contact printing, and all negatives finished and awaiting filing. On the right of the printing machine is the up-to-date enlarging machine, whilst the lenses used in enlarging are kept in one section of a sectional bookcase, free from dust and danger of breakage. The developing tray follows the printing—stop bath, fixing, and the large washing tanks complete this "circle of motion."

The subject of printing could well occupy a talk all its own and still remain inexhausted, but I am just going to touch one phase of the question which ought not to be lost sight of. I refer to the "doctoring of negatives." What volumes of profanity must have been used to express the thoughts of printers towards the poor operatur. Yet it is not always the operator's fault. I make hundreds of the negatives I print, and if those negatives came direct from the dark-room to me, and I was in the habit of using a profane vocabulary, I am afraid I'd often be indulging in the pleasant occupation of cursing myself. Negatives as soon as they are ordered should be returned to the dark-room for careful examination, and a few minutes' work with reducing agent or intensifier, local or general application, will save the printer hours of dodging, and attain a result which no amount of printing can reach. Careful dodging will also give the printing papers a fairer chance. Too many photographers expect the various developing papers to give wonderful results irrespective of the quality of the negative, entirely forgetting the fact that papers can only register what is in the negative.

While on the subject of the printing room I want to offer a few hints upon little necessary items which are incidental to printing. Let me here explain that these little ideas are not all original, some of them have been handed to me in the hope that they would be helpful, and I pass them along to you in the same spirit with the assurance that I have found all of them very useful.

For cleaning the back of a negative before printing, the sanitary and best way is to put a little pulverised pumice in a

piece of coarse-weave flannel cloth. A slight rubbing, without moisture, is sufficient to clean the negative, and, if the negative is very dirty, breathing upon it and then rubbing with the pumice pad will be found sufficient.

A good system of lighting a printing machine is to use twelve 60-watt lights for 11 x 14 size opening, instead of four higher power ones. Fig. 2 will show why. I have numbered each light to illustrate what I mean. Supposing your negative is not

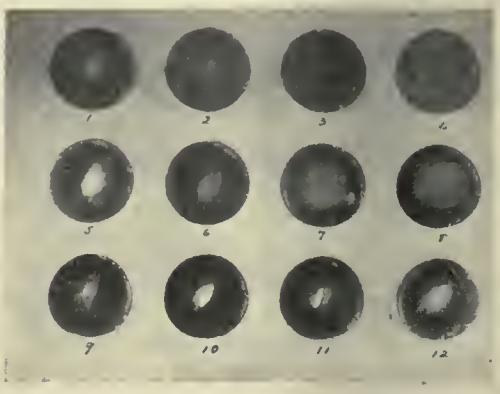


Fig. 2.—Battery of twelve bulbs for an electric printing box.

evenly balanced, and the thin section of it lies over light No. 9, break the contact on that light by unscrewing the bulb, and you "even up" your print; or, *vice versa*, if you have a dense section just insert immediately under it a higher watt—say 75 nitrogen—and in most cases it brings the desired result. I have found this system very efficient in saving time with tissuing,

Fig. 3.—Multiple-vignette print made at one printing from cut-up film negatives.

etc. The reason for so many lights is to enable the printer to localise the corrections better.

Many studios make a speciality of combination prints, four or five on one sheet of paper. I have found by using Portrait Films for the negatives that they can be cut down, fastened to one piece of glass, vignetted, and printed under one exposure instead of having to vignette and print each negative separate, which is a tedious process at the best. Fig. 3 will explain this. This print was made under one exposure.

In making enlargements one sometimes runs across a negative that (especially when using the Cooper-Hewitt light) is too dense to focus correctly. A simple method to overcome this difficulty (which probably most of you adopt) is to get the approximate focus, then insert a thinner negative, get the final focus, and replace the negative you wish to enlarge, and then expose.

Many a time a printer will pull the black envelope out of the outer covering of a dozen sheets of paper. There may be other black envelopes lying around, and confusion as to what grade of paper they contain will be the result. To avoid this purchase a white pencil and mark the grade on the black envelope as you open it: the pencil mark can easily be detected in the dimmest light.

Before proofing your negatives, number the glass side of them with a negative grease pencil. Then, if two negatives are very similar in position you will have no difficulty in telling which one the customer has chosen when the proofs are returned.

If one has to print an artist proof sheet from a subject that is not in the centre of the negative, one can get a little more latitude in width by moistening the finger with a little opaque and running it along the edge of the negative. This will enable one to print to the edge of the negative without getting a black line.

There are various methods of making a diffused print from a sharply focussed negative. I much prefer the result obtained by the following method. Roll your developing paper with the emulsion side in until it stays with a reasonable curve; place in position upon the negative, and hold firmly in contact with the tips of the fingers of one hand, as shown in Fig. 4. Now start the exposure, and with the other hand gently press paper in contact with the negative, allow it to recoil as soon as it

Fig. 4.—Making diffused print by giving some of the exposure with part of the paper out of contact with the negative.

touches, and repeat the operation for about one-half of the exposure; complete the rest of the exposure with the paper in absolute contact with negative. It sounds a bit complicated, but in practice is very simple, and gives a result that is very pleasing.

Absolutely the best method I have found for cleaning discarded negatives is to leave them overnight in used pyro-soda developer. In the morning you will find that a rinse in cold water is all that is necessary to give you the clearest and cleanest glass obtainable.

HERBERT G. STOKES.

(To be Continued.)

SHEFFIELD AND DISTRICT PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.—The annual meeting of the association was held on Tuesday, September 23, in Stephenson's Café. A fair attendance of members has to be recorded, and an interesting evening was spent. The balance-sheet showed a credit balance of over £7 and the prospects of the association are very encouraging. An election of officers took place, with the result that all were re-elected as before. It was decided to invite manufacturers to give demonstration of their products during the coming session, and efforts are to be made to secure new members.

HAMMERSMITH, HAMPSHIRE HOUSE EXHIBITION.—The first of the short interval exhibitions is now open at Hampshire House, Hammersmith. It consists of the originals of "Photograms of the Year," which includes the cream of last year's Salon pictures. Though not attaining the standard of this year's Salon pictures—an exceptionally interesting and high one—they are well worthy of examination and detailed study. Their careful selection and cosmopolitan character are great advantages for purposes of comparison, for being all in the first flight one's judgment is not prejudiced nor attention diverted by the presence of any of a mediocre character.

PRACTICUS IN THE STUDIO.

[Previous articles of this series, in which the aim of the writer is to communicate items of a long experience in studio portraiture, have appeared weekly since the beginning of the present year. It is not thought possible to continue the series to the length of that by the same writer which ran through the "British Journal" some years ago, but if any reader among the younger generation of photographers, and particularly those engaged as assistants, has a particular subject which might be dealt with, his or her suggestion will be welcomed. The subjects of the previous articles of the series have been as follows:—

A Talk About Lighting (Jan. 3).
The Camera and the Lens (Jan. 10).
Managing the Sitter (Jan. 17).
Backgrounds (Jan. 24).
Studio Exposures (Jan. 31).
Artificial Lighting (Feb. 7).
Printing Processes for Portraiture (Feb. 14).
Studio Accessories and Furniture (Feb. 21).
The Surroundings of the Studio (Feb. 28).
Studio Heating and Ventilation (March 7).
The Postcard Studio (March 14).
The Printing-Room (March 21).
About the Reception Room (March 28).
Home Portraiture (April 4).
Portable Studios (April 11).
Copying (April 18).
Handling the Studio Camera (April 25).
More About Lenses (May 2).
Enlargements (May 9).
Advertising the Studio (May 16).
Mounts and Mounting (May 23).
Business Methods (May 30).
Photographing Children (June 6).
Portraits of Elderly People (June 13).
Something about Lenses (June 20).
Hand Cameras for Professionals (June 27).
The Dark-Room and Its Fittings (July 4).
Plates and Their Work (July 11).
Apparatus Repairs and Renovations (July 18).
Posing the Head (July 25).
Intensifying Portrait Negatives (Aug. 1).
Workshop Jobs (August 8).
The Personal Factor (Aug. 15).
The Keeping of Negatives (Aug. 22).
Reduction of Negatives and Prints (Aug. 29.)
Leaky Roofs (Sept. 5).
Blinds and Curtains (Sept. 12).
Miniatures (Sept. 19).
Printing Portrait Negatives (Sept. 26).

WEDDING GROUPS.

As a rule wedding groups do not form a particularly remunerative class of work, and are moreover rather trying jobs, but as a rule they are approached with a certain amount of enthusiasm, not unmixed, on the part of the younger members of the profession, with a little anxiety. One thing that is to the good is that each job serves as an advertisement, as many of the copies come into the hands of those who are likely to want similar groups in a few months or perhaps a year or two. Wedding orders generally want a little looking for, and it is desirable to have a working agreement with those tradespeople who will have early news of the "happy event." Among these are florists, milliners, jobmasters, caterers, and the like. It is a curious thing that the group is often overlooked in the hurry of preparation, so that if the photographer does not approach the bride's friends in good time the opportunity may be lost. It is a good plan to submit three or four specimen groups in a portfolio with a polite note quoting prices.

The next thing to be done is to ascertain where the group can be most conveniently taken. If it can possibly be managed, this should be at the studio, as not only can the difficult contrasts of lighting be more satisfactorily handled, but the members are more easily handled than at home. As a rule the work is done at the bride's home or at the hall where the reception is held, and in this case it is desirable to get the time fixed as early as possible, as after refreshments have been freely partaken of it is sometimes difficult to avoid "moves," while the difficulties of posing and arrangement will be increased. Great tact is often called for when it is necessary to subdue the exuberance of the funny man without giving offence.

One must start with some general idea of arrangement of the figures, the great thing being to balance the light and dark clothing so that a spotty effect is avoided. By this I mean that it is not desirable to place a lady and gentleman alternately, but rather to group the light and dark clothing in masses. A very common scheme which is usually satisfactory is to have the bride and bridegroom seated in the centre; on either side of these are the parents or other close friends; behind this line are grouped the bridesmaids, and other figures are grouped at the sides of these two lines and on a third line behind, if necessary, care being taken that important personages are not relegated to the background. If young children are to be included, they may be placed in front, but not so as to hide any portion of the bride's dress. These little ones may stand in the front row between the elder folk, if preferred.

The choice of a background for an outdoor group is often a difficult one. If it be possible to include the house it will usually improve the lighting and give interest to the picture. Foliage backgrounds are not so good, and should be avoided if possible. Above all, no heads should be allowed to stand out against the sky above foliage or fence. A very nice grouping of a more informal character can easily be arranged where steps coming down from a doorway or French window are available. In this case all the figures may be standing, but due care must be taken that the principal figures are in the most commanding position. Overcrowding on the one hand and straggliness on the other must be steered clear of.

It may be suggested, in extremely unfavourable weather, that flash-light may be used, the group being arranged indoors. Hence it is advisable always to be prepared with a flash-lamp and supply of powder. A friend of mine recently saved the situation in this way when a storm prevented outdoor work from being attempted.

As a general rule 12 x 10 is the size adopted for such groups; it should be pointed out that in smaller sizes the individual portraits are not large enough to be of any value. People expect to pay very much less for whole-plate than for 12 x 10, yet, except for cost of materials, the trouble and expense are the same in either case. If the group is to be an outdoor one, extremely rapid plates should not be used, for with a slower plate and fuller exposure more harmonious results can be obtained: 200 to 220 H. and D. is quite rapid enough. It is absolutely essential to the best results to use backed plates, and to ensure this on short notice it is wise to keep a tube or pot of backing always ready for use. There is no need to wait for it to dry if a piece of thin brown paper be placed at the back of the plate to keep the spring of the partition from touching the colour. A little methylated spirit may be used to thin the colour and will facilitate drying.

More wedding groups are spoiled by over-development than by any other cause, and it is as well to commence development with a solution half normal strength. This should with time give sufficient density in the black coats before the white dresses are overdone. In case there is too much contrast it should be reduced with persulphate in preference to ferri-

cyanide. Persulphate is not difficult to use if all traces of hypo are kept from the plates and a sufficiently strong solution, say 10 per cent., of sulphite of soda used to stop the action.

Printing and mounting are matters for individual tastes. Many photographers still print outdoor groups in P.O.P. and mount them upon plate-sunk mounts. I should prefer a fine platino-matt surface bromide mounted upon a stout cream "art surface" card with bevelled edge leaving a margin of about one inch. That is more convenient for posting than the old mount with a three or four inch margin.

Portraits of the bride and bridegroom only are usually more remunerative than the ordinary groups, and if possible should be taken in the studio. Often the arrangements for the journey prevent this, so that the pictures have to be made "at home," and it is hardly necessary to say that in most cases an indoor portrait will be preferred to an outdoor one. Most decent-class houses have a room with sufficiently large windows for this to be done.

The opportunity of suggesting miniatures in bridal dress should not be lost, as it is usually much easier to obtain orders at a time when the customers are pleased with themselves and everybody else than it will be later on when the bills begin to come in. PRACTICUS.

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Applications, September 15 to 20:—

ROLL-FILM DEVELOPING.—No. 22,912. Devices for developing roll films. C. L. Bambrick.

PRINTING FRAMES.—No. 23,006. Photographic printing frames. J. P. Hansen.

STEREOSCOPIC COLOUR PHOTOGRAPHY.—No. 23,075. Stereoscopic colour photography. R. Highet.

PRINTING MACHINES.—No. 22,765. Photographic printing machines. Kerotype, Ltd., and A. E. Thumwood.

PROJECTION.—No. 23,081. Optical lanterns, cinematographs, etc. W. Pemberton.

COLOUR PHOTOGRAPHY.—No. 22,884. Production of photographic films in natural colours. T. M. Sanders and R. Wellesley.

SELF-PORTRAITURE.—No. 22,858. Self-taking apparatus for cameras. A. Watt.

COMPLETE SPECIFICATIONS ACCEPTED.

These specifications are obtainable, price 6d. each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

COLOUR PHOTOGRAPHY.—No. 119,854 (Oct. 9, 1917). The invention consists in a particular adaptation of copper toning a silver image for the purpose of making a two-colour or three-colour print or film. Details of the process appear on another page in the "Colour Photography" supplement. The following are the claims made in respect to the invention:—

1. A colour photograph or film, comprising colloid material containing different portions of the colloid, respectively a red copper-toned silver image and blue-to-green image blended with the red copper-toned silver image.

2. A colour photograph or film, comprising a colloid layer supported on a transparent carrier, and containing a red copper-toned silver image at either the interior or exterior surface of the said layer, and a blue-to-green image at correspondingly either the exterior or interior surface.

3. Method of producing a colour photograph or film from suitable colour selection negatives consisting in first printing a silver image by exposure from one side, and subsequently colour-toning such image, re-sensitising, and printing by exposure from the opposite side to produce a blended image of a different colour.

4. Method of producing a colour photograph or film from suitable colour selection negatives consisting in first printing a silver image through the transparent base of a sensitised colloid layer, and subsequently colour-toning it, and printing by face exposure a second image of different colour in the same layer.

5. Method of producing a colour photograph or film from suitable colour selection negatives consisting in first printing a convertible silver image at one surface of a colloid layer by exposure through its carrier, and subsequently copper-toning this to a red colour, and after such silver-printing, iron sensitising the same colloid layer and printing a cyanotype image on the opposite face.

6. Method of producing a colour photograph or film from suitable colour selection negatives consisting in first printing a convertible silver image at the interior surface of a colloid layer by exposure through its carrier, then sensitising the exterior surface of the same colloid layer and printing thereat a colour image such as blue-to-green in register with the silver image, and thereafter colour-toning the silver image to a different colour. Hess-Ives Corporation, 1,201, Race Street, Philadelphia, assignees of Frederic Eugene Ives.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

SATURDAY, OCTOBER 4.

North Middlesex Photographic Society. Outing to South Mimms.

TUESDAY, OCTOBER 7.

Manchester Amateur Photographic Society. Beginners' Night. "Bromide Printing and Enlarging." F. G. Curson.

WEDNESDAY, OCTOBER 8.

Croydon Camera Club. "Workshop Aids." H. Guy Johnson.

THURSDAY, OCTOBER 9.

Hammersmith (Hampshire House) Photographic Society. "In the Track of Allenby's Army." Miss S. Nicholls.

Liverpool Amateur Photographic Association. "Photography as Applied to Presswork." F. Curson.

CROYDON CAMERA CLUB.

MR. H. F. FARMER gave a practical demonstration on "Carbro Printing," a process bearing a strong family resemblance to Ozobrome, but having many features apart. Among other things, it is claimed for the newcomer that the uncertainty of Ozobrome has been entirely eliminated, and in addition, that the scale of the Carbro print may be altered with equal precision, in the direction of increased or decreased contrasts. Such claims appear to be fully justified by the highly interesting demonstration given. A member of the club, Mr. Jobling, carried through on his own one Carbro print to a perfectly satisfactory conclusion.

A full description of the process is deferred, but it is only fair to pay a tribute to an enthusiastic amateur for the vast amount of patient experimental work which must have been undertaken before Carbro was placed on a practical basis, and all done for the pure love of the thing, and the advancement of photography. The unanimous opinion of the club was that it is a process likely to appeal very strongly to amateurs in general, and also, it may be added, likely to be of utility to professionals, but that the future alone can decide.

It should be understood that Mr. Farmer in no way belittled the Ozobrome process, indeed, quite the reverse, and the enumeration of the points of difference were only given as indicating the advance made. Mr. Stutchbury, Mr. Inskeep, and others who had worked the Ozobrome process narrated their experiences, and welcomed the new process with great cordiality. Mr. Harpur simply radiated enthusiasm and words which are never frozen or stereotyped. He pointed out that all the beauties of the carbon process were available provided one was provided with a good quality bromide print. Here he somewhat overstepped the mark, for Carbro obviously is limited in gradation to that afforded by bromide papers, which cannot pretend to possess the long scale characteristic of the Autotype or carbon process.

It transpired incidentally that Mr. Farmer, who has knocked about all over the world, invariably follows the doings of the merry Croydonians with interest, and when he came to England consulted some editorial beatitude as to appearing before them. Being informed that a revolver, metal helmet, and gas mask were usual

precautions, he adopted another precaution by dropping in one evening, without revealing his identity, to discover the lay of the land, and found the prospect congenial.

A most hearty vote of thanks was accorded to him with great resonance for an evening almost unique, containing as it did the elements of novelty, a *rara avis* in these days.

Commercial & Legal Intelligence.

An Enlargement Swindle.—At the Penge Police Court last week, Charles Hawkins, of Brixton, was sentenced to nine months for obtaining by false pretences 7s. from Ernest Buller, of Upper Norwood; 5s. from Mrs. Martha Williams, of 1, Richardson's Place, Greenwich; and £1 from Mrs. Winifred Howard, 42, Lenthorp Road, East Greenwich. Accused was identified as the man who called on witnesses for orders to enlarge photographs. Most of the people from whom he obtained money were poor, and he had made a special feature of soliciting orders to make enlargements of soldiers' photographs. Prisoner pleaded guilty, and Detective-Sergeant Ottway said he had obtained orders under various names. He had apparently canvassed all over London, and occupied one room with his wife at Brixton, but there was no photographic apparatus there whatever.

Legal Notices.—Notice of intended dividend is given in the estate of Charles Frederick Siedle (trading under the style of Siedle Bros.), photographer, 60, Walter Road and 13, Heathfield Street, Swansea. Proofs must be lodged on or before October 8 with Henry Rees, Official Receiver, Government Buildings, St. Mary's Street, Swansea.

A first and final dividend of 1s. 5d. in the £ has been declared in the estate of Joseph Edmund Bramwell, photographer, 38, Beechville Avenue, and lately carrying on business at 124, Westborough, Scarborough. This dividend is payable at the Official Receiver's Offices, 48, Westborough, Scarborough.

NEW COMPANIES.

Sanderson, Suter, and Co., Ltd.—This private company was registered on September 23 with a capital of £5,000 in £1 shares. Objects: To carry on the business of manufacturers, importers, and exporters of and dealers in nautical and scientific instruments and photographic apparatus, glass goods, etc. The subscribers (each with one share) are:—R. F. Sanderson, 3, Peter Street, Manchester, shipowner; A. E. Warburton, 8, Peter Street, Manchester, timber importer; W. G. Ineson, 8, Peter Street, Manchester, timber importer. The first directors are:—R. F. Sanderson (managing director), A. E. Warburton, and W. G. Ineson. Qualification £50. Registered offices: 8, Peter Street, Manchester.

Walter Colley, Ltd.—This private company was registered on September 10 with a capital of £2,000 in £1 shares. Objects: To carry on at Birmingham or elsewhere the business of photographic dealers, etc. The first directors are:—A. J. Colley, 81, Taylors Road, King's Heath, Birmingham, drug merchant; W. Holt, 73, Handsworth Road, Small Heath, Birmingham, chemist; Mrs. A. Colley, 81, Taylors Road, King's Heath, Birmingham; Mrs. S. M. Holt, 73 Wordsworth Road, Small Heath, Birmingham. Registered offices: 151-3, Sherloe Street, Birmingham.

Sub-marine Photography.—Details have been published of the method by which a remarkable photograph of the wrecked "Laurentic" was taken at the bottom of the Atlantic on the Donegal coast. The camera was enclosed in a water-tight iron tank, tested to stand pressure 20 fathoms deep in water, and fitted with a vessel's port-hole glass. A diver then took it down, and electric bulbs were lowered from the Admiralty salvage steamship to provide light for the picture. After exposure of an hour and a-half, it was found that an admirable photograph of the wreck had been obtained.

War Grave Photographs.—The Directorate of Graves Registration and Enquiries is unable to receive further applications for photographs of graves in the various theatres of war, but it is hoped that the requests already received will be completed before the close of the year. There is now no prohibition on the use of private cameras. Since the work was undertaken, 120,000 photographs taken in France and Belgium and 2,400 photographs taken in other theatres of war have been supplied to relatives. The requests that have still to be dealt with number 35,795.

Correspondence.

**** Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

**** We do not undertake responsibility for the opinions expressed by our correspondents.*

HYPO-ALUM v. SULPHIDE TONING.

To the Editors.

Gentlemen,—"Thermit's" article on sepia toning ("B.J.," September 25, 1919) interests me muchly, as on all hands I have heard of troubles in toning. Knowing that prints can be toned successfully, I have always been surprised that a better understanding of toning processes has not become general. For many years in Australia I have made sepia prints with regularity as to colour and freedom from many ills that so many run against—blisters, washiness, weight, and double toning. Also we have always been able to get at will any colour from the light-yellowish tone, so much disliked, to a deep chocolate.

We developed with ferrous oxalate, which was allowed to become old by use on bromides earlier in the day. The toning bath was hypo-alum. The bath in use was several years old and was added to as became necessary, no bath being added under the age of three days. The prints lose practically nothing in depth: the colour is regulated entirely by exposure.

Prints were given a very short washing after fixation and transferred direct to the toning bath. Late in the afternoon the bath was warmed for a few minutes and the prints left overnight to tone. In summer our dishes were stood on the asphalt roof yard, and with slight attention—the occasional turning of the prints—three batches daily were toned. After toning all prints were washed for two hours in running water, as were all prints in this establishment.

Blisters I have only seen on one grade of paper by one maker, and in consequence this was never used for sepias. The other grades of paper by this firm were quite satisfactory.

The sulphide process, owing to the numerous blisters, I have not used much. Many firms use it, and experience the usual irregularities of the process. In England my biggest trouble has been caused by the light affecting the prints after bleaching. Of late, in consequence, I have toned in the dark-room with the aid of electric light. I do not know of any paper normally free from blisters when toned by the sulphide process, our summer having to take some blame for this, though winter does not see us free from them.

Seeing that sulphide toning is looked on so unfavourably it is a great wonder that more men do not use hypo-alum. It requires a certain amount of work to get used to the method, but the regularity of result in every way should surely make this worth while. I have always found sepia work both pleasant and profitable, and this without any attendant anxiety.—I am, yours faithfully.

P. A. Peachey.

30, Shenley Road, London, S.E.5.

BRITISH LENS MAKERS.

To the Editors.

Gentlemen,—It is very satisfactory to read, in Messrs. Ross's letter to "The Times," an extract from which you make on p. 569 of "The British Journal of Photography" for September 26, that ". . . we have undoubtedly not only caught up the German manufacturer, but have in many cases surpassed him."

This being the case, I trust this standard will be kept up, so that the British made lens will occupy the position in the world it did in the old R.R. days. There is no question the British made pre-war lenses were, as a whole, inferior to the German, since the introduction of the anastigmat. Please note, I say, as a whole; selectively it was possible to find occasionally a British the equal of any German lens; for instance in 1898 I bought an anastigmat by a well-known English maker, which was as good in every way as any German lens I tried against it, but though I have examined many of the same series since, I have not yet found its equal amongst them. Now take a lens made by a German firm of the same standing, one could purchase a German lens of a given series at one time and place, and then another of the same series somewhere else at another time, and on examination would find the performances of the two lenses identical. I regret I have not found the same applies to the British lens. To give another example, quite recently I have

examined two lenses by an English maker of similar series and equivalent focus, one proved to be a very fine lens, the other I would not use, even if paid for doing so.

My grounds for making such a sweeping condemnation is that photography has been my hobby for over 30 years. I am interested in the optics of it, and have owned probably as many lenses (British French, German, and American) as any amateur; all these lenses have been critically examined by me according to the accepted methods of Traill Taylor, Beck, and others, and also by use in the field. Please note I have no kindly feeling to the Germans, nor ever have had since my school days, but in scientific matters one must be honest; further, my remarks do not apply to British lenses before 1896, nor to post-war lenses, nor to portrait lenses, here, as far my tests go, the British made have always been ahead.

This letter is already longer than I intended, but I would suggest to British lens manufacturers, when issuing reproductions of prints produced by their lenses, as advertisements, that some particulars, such as aperture, and equivalent focus of lens, size of plate, and date be appended. The reproductions I have seen in the photographic press bear no evidence that they were difficult subjects for anastigmat lenses, in fact I could produce as equally good results of most with an R.R. lens I have had for 30 years.—Yours faithfully,

A. R. F. Eversued.

Highgate, N.6., September 30, 1919.

Answers to Correspondents.

SPECIAL NOTICE.

In consequence of general reduced supplies of paper, as the result of prohibition of the importation of much wood pulp and grass, a smaller space will be available until further notice for replies to correspondents.

Moreover, we will answer by post if stamped and addressed envelope is enclosed for reply: 5-cent. International Coupon, from readers abroad.

The full questions and answers will be printed only in the case of inquiries of general interest.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

S. G.—Yes, a licence is required to open a branch establishment. If your branch studio is to be opened in a town in Lancashire, the licence office to which application should be made is at the New Arts Buildings, Liverpool.

C. T.—Yes, a licence is necessary. The address of the office to which to apply is Fine Arts Building, Liverpool. You can get a copy of the Licensing Order by sending a penny stamp and a stamped address envelope to H.M. Stationery Office, Kingsway, London, W.C.2.

R. B.—As a rule, with most papers, sodium sulphide yields a better colour than ammonium sulphide, but any paper which will tone at all by the sulphide process will yield a quite agreeable colour with both. As regards permanency, there is no difference between the two.

N. D.—For a studio of your size the focal lengths of the two lenses are the best you can have for the purpose, since they are the longest foci which can be used in the space. With four 1,000-c.p. half-watt lamps you ought to be able to get short exposures at the full aperture of the lenses and even when stopped down to *f*/6.

B. W.—We are very sorry that we do not know of any formula having been published for the making of gelatine ferrotype dry-plates or postcards This is a branch of manufacture which attracted scarcely any of the experimentalists in the early days of the dry-plate process, so that, so far as we know, there is no literature on the subject.

M. N.—The only book in print giving instruction in collotype is Wilkinson's "Photo-Mechanical Processes," published by Messrs. Hamptons, Cursitor Street, E.C., price 4s. A text-book alone is not sufficient for learning collotype; it should be supplemented by practical instruction, the nearest place (to you) for which is the Manchester College of Technology.

P. H.—1. As you find exposures still so long it would be worth your while seeing if you can get one of the high-power focus type half-watt lamps from the General Electric Company, Ltd., 67, Queen Victoria Street, London, E.C. If you can, and use it with a condenser in your enlarger, it would certainly solve the problem of your long exposures. This type of lamp has been unobtainable for a good many months, but probably can now be had again. 2. The vanadium formula gives a colour very similar to your specimen, but it is a very troublesome formula to make up, and we think you could get a good enough match with the green toning preparations obtainable from the Leto Photo Materials Company, Roman Wall House, 1, Crutched Friars, E.C.

B. A.—We have no information as to the workability of the true-to-scale formula recently contained in a patent specification. A formula for the true-to-scale composition, which was given some years ago by Mr. R. B. Fishenden, of the Manchester Process School, is as follows:—

Glue	8 oz.
Water ... to make	16 oz.
Add—	
Gelatine (dissolved in water to make 2 oz.)	1 oz.
Ferrous sulphate	½ oz.
Glycerine	½ oz.

A second formula is:—

Gelatine (Coignet's)	1 lb.
Water	4½ pints
Size powder	1 lb.
Iron alum (ferric ammonium sulphate)	1½ oz.
Water	1 pint

Dissolve the gelatine in the water, then add the size powder. Dissolve the alum in the water, then add to the glue solution gradually stirring all the time.

Swadlincote Photographic Society.—Efforts are now being made to re-form the Swadlincote Photographic Society, which has been dormant during the war. At a meeting held at the Swadlincote Town Hall, when Mr. A. Gretton presided, Mr. Donald Lee was elected secretary pro tem.

The British Journal of Photography.

The Oldest Photographic Journal in the World.

PUBLISHED EVERY FRIDAY. Established 1854. **PRICE TWOPENCE**

TERMS OF SUBSCRIPTION, POST FREE.

United Kingdom.—One Year, 10s. 10d.; Six Months, 5s. 5d. Three Months, 2s. 9d.

Canada ... ...
Australia ... ...
New Zealand ... ...
South Africa ... ...
United States of America
South America ... ...
India and Far East ... ...
Continent of Europe ...

One Year. Thirteen shillings (13s.), or 3 dollars 17 cents, or 22 francs, or 9 rupees 12 annas, or 6 yens 30 sens.

Federated Malay States, Borneo and Sarawak 5 dollars 57 cents.

Henry Greenwood & Co., Ltd., Proprietors and Publishers, 24, Wellington Street, London, W.C.2.

IMPORTANT NOTICE TO READERS.—Until further notice agents will supply the "B. J." to order only, as the high price prevailing for everything in connection with newspaper production prohibit the distribution of surplus copies for chance sales. It is therefore necessary in order to ensure the regular delivery of the "B. J." each week to place an order definitely with a dealer, newsagent or bookstall clerk, or to send a subscription to the publishers.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3101. Vol. LXVI. FRIDAY, OCTOBER 10, 1919. Price Twopence.

Contents.

	Page
Ex-Cathedra	581
Some Further Notes on Tracing Defects in Negatives	582
The Carbro Printing Process. By H. F. Farmer	583
Practicus in the Studio. By Practicus	587
Efficiency in the Workroom. By Herbert G. Stokes	588
Storing Sensitive Papers	590
Assistants' Notes	590
Patent News	591
Forthcoming Exhibitions	593
New Books	593
Meetings of Societies	593
Commercial and Legal Intelligence	593
News and Notes	593
Correspondence— A Drying Cabinet for Negatives—Sensitising Canvas—A Common Cause of Loss of Business	594
Answers to Correspondents	596

SUMMARY.

The 1920 British Journal Almanac, now in preparation, will be published early next year in its pre-war edition of 25,000 copies.

In a contributed article Mr. H. F. Farmer gives full working details of the modification of the Ozobrome process which he has named Carbro. The tissue is "sensitised" in a single bath, ordinary carbon tissue is used in making the carbon prints, and the process possesses the special feature of allowing of greater or less contrast being produced in the prints by a very simple modification of the working. Mr. Farmer also describes a very simple and efficient form of squeegee board, and has worked out a table of times for the immersion of tissues of different colours in the sensitising bath. (P. 583.)

In the further instalment of the paper by Mr. Herbert G. Stokes the construction of a rotating trimming desk is described, as also an efficient form of retouching bench for use both by day and artificial light. (P. 588.)

In his article this week "Practicus" deals with the simple forms of combination printing which a photographer now and again is called upon to carry out. He particularly describes methods suited respectively to print-out and development papers. (P. 587.)

In a letter to the Editors a correspondent describes at length the card-index system employed by himself for keeping track of orders passing through his studio establishment. (P. 594.)

A contributor to "Assistants' Notes" deals with the system which can be followed in carrying out a course of self-training in learning to draw. (P. 590.)

Caution as to the storage of sensitive papers is contained in an extract from Rajar "Trade Notes." (P. 590.)

In a leading article we seek to show the useful information which can be obtained in diagnosing the cause of white spots on negatives from the use of a magnifier. (P. 582.)

A new construction of large-aperture telephoto lens is among the Patents of the Week. (P. 591.)

Working formulæ for the sensitising of canvas are given by a correspondent. (P. 594.)

Firelight portraits will shortly be a seasonable type of photographs for window specimens. (P. 582.)

In preparing photographs for use as Christmas gifts photographers might give attention to a somewhat more decorative scheme of mounting. (P. 581.)

In meeting the competition of the camera pressman in the photography of wedding groups, the portrait photographer, in addition to exploiting his greater opportunities, may often require to meet the pressman on the latter's own ground. (P. 582.)

EX-CATHEDRA.

The 1920 Almanac. The fifty-ninth annual issue of the "British Journal Almanac" is now in active preparation. On the assumption that industrial conditions continue fairly normal, it will be published during the first week of February next. Assuming, also, that no untoward events interfere with our plans, features of the book which during the last two or three years had to be withdrawn in consequence of paper rationing will be replaced, and the edition of the volume will be restored to its pre-war figure of 25,000 copies. On behalf of our publishers it must be said that the compulsory cutting down of supplies of the book to dealers and exporters in this country as well as to agents overseas was a policy which they were compelled to adopt with very great regret. It is hoped, however, that the demands for this issue, which may be said to be the first to appear after the conclusion of the war—the 1919 volume was produced for the most part during the period of hostilities—will be reasonably met. In consequence of the railway strike the time for the preparation of the forthcoming issue has been curtailed by a week, so that intending advertisers will very greatly facilitate the work of our publishers by giving the earliest possible intimation of their requirements. The necessity for this request could hardly have been foreseen when preparing the circular announcing the Almanac, which now should be in the hands of every firm in the trade, but we hope that advertisers will make a note of this intimation and, wherever possible, act upon it.

* * *

Gift Portraits. Photographers have not failed as Christmas approaches to point out the desirability of making the seasonable gift take the form of a portrait, but not all of them have realised the necessity for clothing the print in an attractive manner. Many do not make any attempt to present any other styles than those they use all the year round, and these are often a little too plain for the particular purpose. When we note the taste and care with which jewellery, draper's goods, and even chocolates are packed, a photograph stuck upon a piece of brown paper has anything but a festive appearance, and we think that in many cases increased business would result from the introduction of more elaborate styles of entourage. We believe the public would welcome a smaller picture in a very good quality of folder in place of a large print plainly mounted at the same price. Large prints call for very careful and substantial packing, and even then are liable to damage in transit. Another direction in which business might be extended is that of coloured work. There are now many well-trained colourists available, so that it should not be difficult with a good-class clientèle to sell coloured prints by the dozen instead of by the unit as we do now.

Seasonable Specimens. The approach of winter gives the opportunity for the display of a few specimens of a style which is not often in evidence nowadays. We refer to the firelight effects which some photographers have produced very successfully, although others have been deterred by the fear that elaborate arrangements were necessary for lighting. This may be true if daylight only is available, but with artificial light there is no difficulty, as the light can easily be transferred to any desired position so as to give the effect of the glow from an ordinary fireplace. To our mind this style is most effective on whole-plate or larger sizes, and as cold tones are desirable enlargements may be made upon a "carbon" or velvet surfaced bromide paper, which, when dyed, gives an excellent result. One thing to be avoided is a pinkish tint in the dye used, as this quite spoils the firelight effect. A deep orange is perhaps the best colour, and sometimes this is improved by a dip in a weak solution of ordinary red ink. Such pictures are best framed close up in dark oak, but in any case a light mount should be avoided.

* * *

Labour Celebrities. The recent prominence into which the "Eleven" and afterwards the "Fourteen" of the trades union world have come as a result of the negotiations over the railway strike prompts the observation that for men of their position in the industrial life of the country there is a conspicuous absence of their portraits in the bookstall and shop displays of postcards throughout the country. Apparently, even within the circle of their own unions, portraits of labour leaders are not good sellers. The recent newspaper publicity accorded to them, and particularly in the illustrated Press, may perhaps bring about a change in this direction, so that we may have Mr. Gosling and Mr. Robert Smillie rubbing shoulders with Gerald Du Maurier and the universal Gladys Cooper in the postcard shops. On the other hand, it may reasonably be thought that at the present time the attractiveness of the trade union organisers, even to those who benefit by their labours, is expressed in terms of satisfaction with increase in wages rather than in any idolisation of the individuals. We shall see what we shall see, but for the present it seems pretty safe to say that a postcard publisher making a specialty of a series of portraits of trades union leaders will, to put it mildly, be regarded as highly optimistic by his competitors.

* * *

Press and Portrait Photographers. The question of a Press photographer poaching upon the preserves which the purely portrait photographer has come to regard as his own was discussed a little while ago, and was freshly brought to our notice during the past week at a wedding function. On the arrival of the bride at her mother's house after the ceremony a portrait photographer who had been asked to come and take some groups of the wedding party attended for that purpose. He was three-quarters of an hour late in keeping the appointment, but nevertheless spent something like an hour in making about half a dozen exposures on groups of the bride and bridegroom and of these latter with others of the party. He had scarcely packed up his apparatus and taken his departure when a motor-cyclist arrived with excellent finished bromide prints of the bride and bridegroom and the bridesmaids, taken as they were leaving the church. A Press agency's photographer had asked these members of the party to halt for an instant on their way to their carriages and had made several photographs, which were very good of their kind, and, at any rate, were thought to be excellent by members of the party, who evidently, though perhaps unconsciously, found some added merit in them in the fact of their very rapid production. In large towns competition of this kind is bound to go on, and it is for the portrait photographer to consider how he shall deal with it. Plainly it is within his powers to offer the same kind of service as the Press agency, which, as a rule, will score over the carefully posed group in the more pleasing expression of the subjects, even though the photographs may be inferior technically. On the other hand, such photographs as can be made whilst the wedding party is dispersing from the church are usually not all which are required. Convention in most cases demands a group in which the parents and other friends of bride and bridegroom are included with them and are arranged with regard to the family connections. This is one way by which the business may be prevented from passing into the hands of the Press photographer, but obviously if the latter's competition is to be met it must be met on his own ground.

SOME FURTHER NOTES ON TRACING DEFECTS IN NEGATIVES.

A FEW weeks ago, in our issue of September 5, we had something to say on the lines of inquiry along which a photographer, who cannot call to his personal aid some expert advice, must work and think in solving his own difficulties. In those notes we selected, by way of example, the various causes, before and after exposure, which may lead to fogged negatives. Negatives which are defective in this respect are among those which are most commonly sent to us for our advice in helping the querist to identify the cause of his trouble, but as everybody knows they by no means exhaust the possibilities of going wrong which apparently, to many of the inexperienced, present themselves under a formidable aspect. In the case of other defects, it is often possible by more direct means to come to a conclusion as to what is the cause and what means require to be taken for prevention. For example, the occurrence of clear spots on negatives is a thing which a little commonsense inquiry will speedily trace to its source, yet it is a common experience of ours that many a tyro in the handling of plates will send such spotted negatives to the editor of a paper or some other adviser rather than take the trouble to think for himself and use his own judgment. It does not seem to occur to many that one of the first things which should be done in the case of such spotted negatives is to examine the spots under a fairly strong magnifying glass. For this purpose the ordinary focussing magnifier, particularly if of fairly decent power, is quite suitable. Another very convenient pocket instrument is the so-called folding linen-tester, much in favour among makers of half-tone negatives for examining the dot formation. One advantage of it is that its skeleton construction allows of it being used just as well for paper prints or for any opaque surface as for things like negatives which, with the ordinary focussing magnifier, can be examined by transmitted light. Another little piece of apparatus, also suitable both for negatives and prints, but less handy for the pocket than the linen tester, is the solid glass magnifier sold by dealers in postage stamps for examination of the details of stamps.

Incidentally, a magnifier of this kind is a very useful thing to have as a means of quickly distinguishing between different kinds of photo-mechanical prints. With a little practice it is easy to recognise in a moment the characteristic grain of lithographic and collotype prints, whilst, of course, the dot structure of fine half-tones is instantly disclosed. We mention this, as an aside, because we are not infrequently asked to say what photographic process has

been used for the making of prints, samples of which are sent. More often than not it turns out that such prints are not photographs at all, but are usually either collotype or photo-lithographs.

Now under a magnifier white spots which to the eye may appear just like any others will be seen to exhibit characteristic differences according to the circumstances which have caused them. If they are seen to have graduated or vignetted edges it can be pretty well taken for granted that the spots are due to air-bells adhering to the plate during development. A spot due to this cause is usually also quite circular in shape and of some size, say, from one sixteenth to one-eighth of an inch in diameter. Both the roundness and the vignetting of the edges mark the cause we have mentioned. The softening of the outline is no doubt due to the gradual dispersing of the minute bubble of air as development proceeds, this process, in turn, no doubt, being due to the air gradually dissolving in the developer. Thus developer gains access to the outside portions of the spot, although, as a rule, not to such an extent as to give any deposit of density upon the central portion. Inasmuch as these air-bells adhere with some tenacity to the gelatine film it will not do to suppose that simple rocking of the developing dish will detach them. Where conditions are favourable to their formation on the film, as, for example, by using aerated water from the tap for mixing the working developer, it is necessary that the whole surface of the plate should be swabbed over firmly with a tuft of cotton-wool as soon as the developer has been applied. On the other hand, there are much smaller spots, also clear, which, under a magnifier, are seen to be all kinds of shapes and also to be quite sharp in outline. These, in nine cases out of ten, are due to dust on the plate at the time of exposure. The preventive in this case is, perhaps, not that which will naturally occur to every beginner. It has so often been repeated in text-books that plates should be carefully dusted before being placed in the holders that the isolated worker, whose only guide is often the text-book, concludes that he has only got to dust plates with a camel-hair brush in order to be free from these defects in his negatives. Experience, in time, will teach him that the advice proves fallacious in practice. At the present time plates as taken from the makers' wrappings are free from dust to a remarkably high degree—the dust which accumulates on them before exposure comes almost invariably from the plate-holders themselves or from the dusty condition of the inside of the camera. Those who have cause to complain of negatives which are faulty in this way should try the effect simply of giving the plates a smart tap on the dark-room bench as each is put into the holder, and for the rest, take care that the plate-holders and the inside of the camera are regularly wiped out with a slightly damp cloth. If this is done, it will be found that there is nothing to complain of as regards these defects on the negatives.

There are also to be met with, though very infrequently, clear spots of circular shape and sharp outline which often are considerably larger than those commonly due to air-bells. They may, however, be of almost any size, and if probed with a fine needle will at once disclose their cause by the absence of any emulsion coating. Spots of this kind, as we have just said, are most infrequent in plates by any maker of recognised reputation. Except for a very few rare examples, we can only recall having met them on plates which have been put upon the market by beginners in the emulsion-coating of glass, or, perhaps, have been bought at a job rate from another maker and offered at a price which necessarily implied that something was the matter with them. We can recollect having examined box after box of plates which were issued at a very "cut" price: without exception every plate was defaced, often to an extent which rendered it quite unusable, by spots of this kind. On the other hand, the maker of reputation cannot escape the charge of faulty manufacture if spots of this kind are brought to his notice, and, so far as our experience has gone, is never averse from accepting such responsibility readily, inasmuch as the bringing of it to his notice demonstrates the necessity of improving the work of the employees who examine plates before packing.

Sometimes the unsuspected clue to the cause of markings on a negative will lie very near to hand. We recollect an instance in which a well-known firm of commercial photographers was plagued by mysterious dark, circular spots about one quarter of an inch in diameter, which in a most erratic manner made their appearance on negatives, yet always at such definite distances apart that the cause was sought, fruitlessly as it turned out, in some defect of the lens. Trials with all kinds of lenses failing to eliminate the defect, it was suddenly realised that the positions of the spots corresponded roughly with those of the finger tips of the outstretched hand. That gave the clue: it was speedily discovered that in handling a number of plates before development, they were stacked on their edges in the dark-room, the glass surface of one in contact with the emulsion film of the next. The spots arose from the transference to the back of a plate of the impression of the finger tips (applied in pushing the plate into place) to the emulsion film of the plate next laid in position. A simple enough explanation, once the photographer had made the observation that the positions of the spots corresponded with those of the extended finger tips.

THE CARBRO PRINTING PROCESS.

[The following article embodies the work of several years' experiment, which its author, Mr. H. F. Farmer, has carried out solely in the aim of bringing to a state of working perfection the process of making carbon prints by contact, in presence of a "sensitising" solution from bromides. Mr. Farmer informs us that the name "Carbro" has been selected as distinctive in itself and as indicating the nature of the process, viz., carbon prints from bromides.—Eds. "B.J."]

The process of making carbon prints from bromides is not new, as it was invented fourteen years ago by Mr. Thomas Manly, and has been familiar as the Ozobrome process. The Carbro process, which is now described, as will be observed, follows on the general lines of Ozobrome, but differs from it in the fact of the tissue being prepared by treatment in one single bath; also ordinary carbon tissue is employed in the Carbro process, in which it has been possible to standardise the times of treatment for tissues of different colour. Since the publication of an earlier article outlining the Carbro process, the writer has received so much encouragement from those who have given Carbro a trial that it was decided to continue experimenting in the hope of making the working so mechanical as to bring it within the reach of the most inexperienced worker. This has now been accomplished, and altogether seventeen colours of Autotype carbon tissue have been successfully adapted to the process.

Early experiments soon showed quite a variation in the time

of immersion required for different colours, with dark blue at the short end (only 3¼ minutes), ranging to engraving black, with a lengthy immersion of ten minutes before detail was obtained in the high lights. It was found possible to work the whole of the thirty colours manufactured by the Autotype Co. in a single working bath, but the time of immersion of some of the colours was so unduly prolonged (as in the case of engraving black) that a second working bath was introduced for the purpose of reducing the time to something more convenient. With these two working baths the whole of the colours appeared to drop into two series, and the table given is probably the most convenient method that it will be possible to introduce.

A comparison between the two working baths will show that while the proportion of "B" and "C" differ, the quantities of "A" solution and water remain constant. This last point is most important, and the worker is advised to adhere to the figures as closely as possible, obtaining control for pictorial results by varying the proportions of "B" and "C" solutions only.

Temperature, too, has a considerable influence on the chemicals used, and the ideal temperature for the working baths is between 55° and 65°. It may be pointed out here that 55° to 65° F. is the normal temperature of a living-room in England both winter and summer, and as the process requires no dark room the whole of the work may be carried out in cold weather beside the kitchen fire.

The keeping qualities of the stock solutions are excellent, and the working bath, until used, and thereby contaminated with organic matter from the carbon tissue, keeps for months. This is a useful point, as it permits the mixing of the working bath a day or two before required, and, by keeping it in a living-room, the mixed solution will take the temperature of that room and be ready for use at any time.

For the information of those who are unacquainted with the Carbro process, the first part of this article gives full working instructions, while the latter part will contain information which may prove useful should any difficulties arise.

Briefly, a piece of commercial carbon tissue is "sensitised," and while wet brought into contact with a bromide print—this bromide acting as a "negative." These are allowed to remain in contact for about fifteen minutes, then separated, and the carbon tissue squeegeed to a piece of transfer paper. On this transfer paper the picture is developed, and the final result is a carbon print from the bromide. The picture is not, as in the single transfer of the carbon process, reversed from right to left.

The following are the stock articles required:—

A good bromide print.
Carbon tissue.
Single transfer paper.
Squeegee.
Squeegee board.
Dishes.

A flat squeegee is best, and a useful length for all prints up to 12 by 15 ins. is 8 ins. The dishes should be porcelain or enamel; papier-mache is too difficult to clean, and thorough cleanliness is essential. The drawing shows an easily made squeegee board which entirely prevents slipping.

It will be seen from the above that there is no great outlay for the initial work, and neither will the future require any additional expense.

The sensitising baths are made up from the following stock solutions:—

A. Bichromate of potash	45 gms.	400 grs.
Bromide of potash	20 gms.	175 grs.
Ferricyanide of potash	20 gms.	175 grs.
Water	1,000 c.c.s.	20 ozs.
B. Chrome alum	35 gms.	300 grs.
Bisulphate of potash	5 gms.	45 grs.
Water	1,000 c.c.s.	20 ozs.
C. Bisulphate of potash	5 gms.	45 grs.
Water	1,000 c.c.s.	20 ozs.

All the above appear to keep well if stored in a cool, dark place

From the stock solutions make up the following sensitising bath:—

Sol. A	50 c.c.s.	1¾ ozs.
Sol. B	9 c.c.s.	2½ drams
Sol. C	6 c.c.s.	100 minims
Water	200 c.c.s.	7 ozs.

For convenience, this may be called *aa* bath.

This is a most useful quantity for half-plate; for whole-plate use 50 per cent. more, keeping the same proportions all through, and for 10 by 12 double the quantities.

First place the bromide print in cold water and allow it to become thoroughly soaked; now take a piece of carbon tissue, cut about half an inch larger than the bromide from which the Carbro is to be made, and immerse face downwards for a definite time, according to time and colour table *aa* given at the end of this article. About a minute before the end of the time of immersion of the tissue remove the bromide print from the water and lay it face upwards on the squeegee board. At the expiration of the exact time, withdraw the carbon tissue from the sensitising bath, and, after allowing it to drain for a moment, lay it face downwards on the bromide and squeegee into contact. Now mop off any superfluous moisture from the back of the tissue and cover with a piece of paper, or preferably waterproof cloth. Place a book over this to prevent the tissue from curling, and thereby losing contact, and leave them in this position for from twelve to twenty minutes—the exact time is not a material point if kept within those limits.

A detail which requires emphasis is that from the moment of contact of tissue and bromide the sensitising action begins; it therefore follows that once the two have touched there must be no attempt to adjust the carbon tissue if it has been laid down at the wrong angle, as such a course would inevitably result in a blurred or double image. Should any slipping occur, it is far better to squeegee and make the most of the resulting picture, as under no circumstance may the tissue be moved.

Towards the end of the time of contact of bromide and tissue (twelve to twenty minutes) take a piece of transfer paper cut slightly larger than the carbon tissue, and soak this in cold water for about half a minute if of the thin variety, and about a minute for the thicker papers. Complete wetting is necessary, but over-soaking has a tendency to lead to frilling and other troubles during development.

After wetting the piece of transfer paper, hold it up to drain for a moment, then lay it face upwards on the squeegee board. Now take the carbon tissue and bromide, still in contact, and by raising one corner of the tissue steadily pull the two apart; leave the bromide for the present, place the carbon tissue face downwards on the transfer paper, and squeegee the two into contact. Remove them from the board, place them between blotting paper with a book over them to prevent curling, and allow to remain there from twenty minutes to one hour (a couple of hours will do no harm). Go back to the bromide print, now bleached to a pale yellow, and place this in a dish of cold water for washing and redevelopment.

It is advisable to change the wash water during the first few minutes of washing, as the greater part of the sensitising bath, transferred from the carbon tissue to the bromide, washes out very quickly. Obviously, this water soon becomes a solution sufficiently strong to have some material effect on the bromide print. After changing the water the print may be ignored until the process is finished.

The development of a Carbro print is a far simpler matter than the development of bromides, no chemicals being required.

After sufficient time has been allowed for the pigment of the tissue to adhere to the transfer paper, tissue and transfer paper are placed in a dish of warm water. Start with a temperature of about 95° F., the hand being sufficient guide. Keep the two papers, still adhering, well covered by the warm water, and wait until the pigment commences to ooze round the edges of the carbon tissue. This usually takes a minute or two, and if at the end of that time the oozing is not very apparent, a little more hot water may be added, great care being taken that the temperature is evenly distributed. As soon as the oozing shows all around the edges, carefully lift one corner of the carbon tissue, and, keeping the transfer paper as much as possible under water, steadily strip the two apart. The transfer paper will now be seen to be covered with a thick coat of pigment, a smaller quantity remaining on the carbon backing. This piece of backing has now completed its work and may be thrown away.

Turn the transfer face downwards in the water and proceed with the development by holding one edge and gently moving the print over the surface of the water, great care being taken not to touch the bottom of the dish. A better plan, if the dish is large enough, is to gently splash the face of the pigmented transfer paper, and as the picture begins to reveal itself the splashing may be local for reducing any particularly dense part at the desire of the worker.

Development is complete when it becomes obvious that no more pigment will wash away, and the picture is laid face downwards in cold water to clear it from any loose pigment on its surface.

It will now be noticed that where the carbon tissue has been in contact with the transfer paper the latter is marked with a bichromate stain, to remove which the print is placed in a bath consisting of a 3 per cent. solution of alum, and allowed to remain until the stain has disappeared. This may be done immediately following development, or the print may be dried and alumned the following day. The alum bath may be used repeatedly until its failure to remove the stain shows that it is exhausted. Should the solution become very dirty it merely requires straining through a piece of old cotton or muslin.

This completes the process, and the bromide, after well washing (twenty minutes in several changes is all that is needed), may now be redeveloped, well washed, and is ready for further Carbro prints, no fixing being required.

It is most important that the redevelopment of the bromide print be very thorough, and the prints are best left face downwards in the developer for at least fifteen minutes. If this redevelopment is not complete it will be found that all succeeding Carbros will lack detail in the high lights, and once the high lights have suffered from this insufficient redevelopment there appears to be no means of retaining them in Carbro, except by slightly increasing the proportion of B solution in the sensitising bath.

Both for the original development of the bromide and also for redevelopment, M.Q., Azol, and amidol all give excellent results, the writer's preference being for the last mentioned. For redevelopment (which, by the way, requires no dark room and no fixing) it is better to omit bromide of potash from the developer.

Some Useful Notes.

In making first attempts with the Carbro process the worker is advised to try a preliminary test, using 3 cc.s (100 minims) less of C solution than the given formula, and, with two similar small bromide prints, give one piece of tissue an immersion of fifteen seconds less, and one an immersion of fifteen seconds more than the time given for the colour which is being worked. The transfer paper may be marked on the back for future reference, with the formula used and the time of immersion (example: A.50, B.9, C.3—4¾ min.). This would form a permanent guide for future reference, and give the worker a clear idea of the effect of varying the time.

It is interesting to note here that the time of immersion may be well compared with the time of exposure of a bromide print —under-immersion (exposure) gives increased contrast, over-immersion (exposure) gives general flatness with high lights veiled. Over-immersion may be remedied by using hotter water for development; under-immersion has no remedy. If in doubt give the tissue fifteen seconds more immersion than the standard time.

Excess of B solution produces a general clogging, with a heavy deposit of pigment; excess of C solution slows the action of the bath, and longer immersion is needed to obtain definition in the high lights. At the same time it holds back the shadows and general flatness results. This last detail is very useful for a harsh bromide, as by the addition of about 3 cc.s (100 minims) of C, any degree of softness may be obtained, but don't forget to prolong the immersion from half to one minute.

The treatment of the original bromide print is an important factor in the final results obtained, and correct exposure and development are very essential. Over-exposure and under-development of the original bromide print produce great flatness, and the richness of the shadows is entirely lost in the final Carbro print. A weak bromide gives a weak Carbro, and for a weak negative the enlargement is best made on gaslight paper.

There are occasions when slight over-exposure of the bromide may be turned to useful account, as in the case of bald-headed skies. Slight over-exposure in bromide gives the appearance of fogging, but the deposit of pigment in the sky of a Carbro print gives a suggestion of colour. Wherever there is reduced silver in the bromide there should be a deposit of pigment in the Carbro print.

The figures of the time and colour table have been worked out for all the principal British makes of bromide papers, platino matt being the most useful. Some makes which appeared to contain very little silver required quite a lengthy immersion, one paper taking eight and a-half minutes for sepia. There is no doubt that any paper will give a good Carbro, but such a prolonged immersion as 8½ minutes might be very baffling for a beginner.

Some bromide prints (make forgotten, but either Paget or Wellington and Ward) made over eight years ago gave excellent results.

Gaslight papers, on the other hand, need only three-quarters of the time given for bromides (same proportion for all colours), and the exact proportion of Wellington and Ward gaslight to their bromide platino matt is 11/16th. Gaslight paper gives Carbro prints fully equal to those obtained by bromide, and is therefore a valuable asset when dealing with a flat negative.

Although the tables are given as working at a temperature between 55° and 65° F., it is advisable to keep as near to 60° F. as possible. Successful work has been done at 78° F., but above 70° F. trouble develops on account of the softening of the tissue necessitating great care to prevent slipping when squeegeeing to the bromide. Also there is danger of crushing the high-lights when squeegeeing to the transfer paper. Below 55° F. the activity of the chemicals varies in different proportions, upsetting the balance of the working bath. Obviously, too low a temperature is best avoided; it is an easy matter to raise the temperature by putting the bottle of working bath in warm water before pouring into the dish.

A convenient method of working a number of Carbro prints is to take them in lots of four. Put in the first tissue, then immerse the other three at regular intervals of two and a-half minutes, and by the time the last one is out the first will be ready for the transfer paper. Quarter-plate prints may be worked, if all of the same colour, with four prints on one piece of tissue. Lay them in a square on the squeegee board, with a

space of about ¼ of an inch between them, and cut the carbon tissue about 7½ by 9½; this gives a comfortable margin for squeegeeing. For all work it is best to cut the tissue about ¾ of an inch larger than the bromide to allow for error when placing the two in contact.

For economy and convenience in working an excellent plan is to classify the bromide prints according to the desired colour, then, having mixed one working bath, continue with the colours belonging to that bath until the mixed solution is exhausted. It is worth noting that filtering after use will increase the keeping qualities of the working bath, but the bath is very cheap and there is no need to use stale solutions.

Carbro has many advantages over bromide printing:—It is permanent pigment; and you know before you commence working what the final colour will be. This cannot be said of bromide toning. It is simpler than bromide making, and you have a choice of seventeen colours, with about ten different surfaces of paper support. In cost, Carbro has a fractional advantage.

Beware of air bubbles on the tissue during immersion. This is best avoided by lightly pressing the paper to the bottom of the dish and stroking the back of the tissue during the first minute of immersion.

Accurate measurement of all solutions is imperative. One c.c. (15 minims) more or less of B or C solution might make a difference of half a minute in the sensitising bath.

Store all solutions in the dark—light has a very powerful action on bichromate, and also on ferricyanide. In the dark these two are fairly stable.

Should the working bath suddenly give a very harsh print it is an indication that it is exhausted.

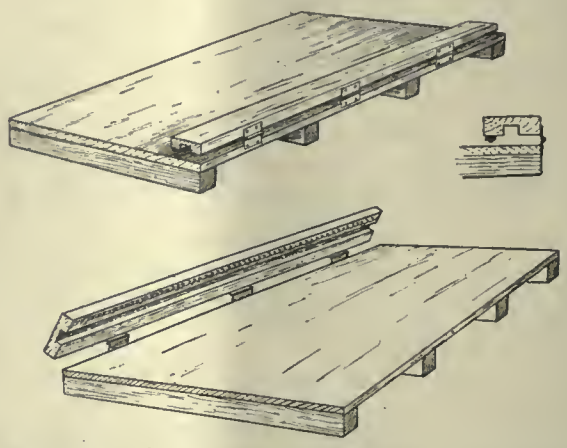
Oxalic acid may be substituted for bisulphate of potash, but its keeping qualities are not good, especially in the mixed bath, and its use is not recommended. Bisulphate of potash can be obtained from Messrs. Johnson and Sons, Cross Street, Finsbury, London, and must not be confused with the bisulphite salt.

The process is suitable for transparencies, and prints on wood and silk, the method of preparing the support being the same as that given for the carbon process in the Autotype Co.'s booklet. For transparencies, give a rather longer immersion than for paper support, half a minute being sufficient for most of the colours.

And just one "don't"—don't attempt modification of the working bath until you have become acquainted with the process. If you have any difficulty write to the Editor of the "B. J." and ask him to pass the letter on.

Squeegee Board.

The accompanying sketch shows a very useful type of squeegee board, designed to prevent slipping. It is inexpensive and easily made. The strips along the bottom should be about half or three-quarters of an inch in thickness, so that the fingers may be inserted under the board, while the thumb presses the hinged piece on the top. A pencil line should be marked the full length of the board, as a guide for laying down the bromide print; and three-eighths of an inch further back, another line as a guide for the tissue. The rubber strip runs the whole length of the hinged piece, and the best thing for the purpose is a piece of studded rubber, rather thin, such as is used for office stair matting. Failing that, a piece of square elastic about an eighth of an inch thick. The rubber can be fastened on with very small headed nails or tacks placed fairly close together.



The upper illustration shows the hinging of the clamping strip at the requisite height above the base. In the lower drawing is indicated the edging of studded rubber.

Time and Colour Tables.

The table for use, at a temperature of 55° to 65° F., and for working bath (*aa*), is:—A, 50; B, 9; C, 6. Water, 200 c.c.s., *i.e.*, A, 1¾ ozs.; B, 2½ drachms; C, 100 minims. Water, 7 ozs.

Colour of Carbon Tissue.	Time of Immersion in Sensitising Bath.
Dark Blue	3¼ minutes.
Terra Cotta	3½ ,,
Standard Brown	4¼ ,,
Sepia	5½ ,,
Sea Green	3¼ ,,
Vandyck Brown	5½ ,,
Bottle Green	4 ,,
Italian Green	4¼ ,,

For contrast, omit "C" and shorten time by ½ minute.

For working bath (bb):—A, 50; B, 16; C, 16. Water, 200 c.c.s., *i.e.*, A, 1¾ ozs.; B, 5 drachms; C, 5 drachms. Water, 7 ozs.

Warm Sepia	4½ minutes.
Red Chalk	5½ ,,
Brown Black	5¼ ,,
Rembrandt Sepia	4½ ,,
Cool Brown Mezzotint	4¾ ,,
Warm Black	4½ ,,
Ivory Black	5 ,,
Engraving Black	6 ,,
Grey Green	4½ ,,

For contrast, 6 c.c.s. (100 minims) less of "C" and shorten time by ½ minute.

All the above figures are suitable for Platino Matt bromide papers, Wellington and Ward, Imperial, Paget, and Illingworth giving very similar results.

Wellington and Ward S.C.P. Matt (a gaslight paper) requires exactly 11/16 of the above times.

H. F. Farmer.

Toronto Camera Club.—Judging from the catalogue which has been kindly sent to us, the recent exhibition arranged by the Toronto Camera Club in connection with the Canadian National Exhibition was a success, both pictorially and in the interest which it attracted among photographers both in Canada and the United States. British pictorial workers were represented only by a few of the stalwarts of the Liverpool Amateur Photographic Association.

Yorkshire Photographic Union.—The Yorkshire Union has just issued its handbook for 1919-20, the chief item of contents being the lengthy list of lecturers and demonstrators and of the subjects with which they are prepared to deal in addressing photographic societies. The list represents a very great variety of travel and technical fixtures, and incidentally is a demonstration of the continued energy and interest which our Yorkshire friends display in photography.

PRACTICUS IN THE STUDIO.

[Previous articles of this series, in which the aim of the writer is to communicate items of a long experience in studio portraiture, have appeared weekly since the beginning of the present year. It is not thought possible to continue the series to the length of that by the same writer which ran through the "British Journal" some years ago, but if any reader among the younger generation of photographers, and particularly those engaged as assistants, has a particular subject which might be dealt with, his or her suggestion will be welcomed. The subjects of the previous articles of the series have been as follows:—

A Talk About Lighting (Jan. 3).
The Camera and the Lens (Jan. 10).
Managing the Sitter (Jan. 17).
Backgrounds (Jan. 24).
Studio Exposures (Jan. 31).
Artificial Lighting (Feb. 7).
Printing Processes for Portraiture (Feb. 14).
Studio Accessories and Furniture (Feb. 21).
The Surroundings of the Studio (Feb. 28).
Studio Heating and Ventilation (March 7).
The Postcard Studio (March 14).
The Printing-Room (March 21).
About the Reception Room (March 28).
Home Portraiture (April 4).
Portable Studios (April 11).
Copying (April 18).
Handling the Studio Camera (April 25).
More About Lenses (May 2).
Enlargements (May 9).
Advertising the Studio (May 16).
Mounts and Mounting (May 23).
Business Methods (May 30).
Photographing Children (June 6).
Portraits of Elderly People (June 13).
Something about Lenses (June 20).
Hand Cameras for Professionals (June 27).
The Dark-Room and Its Fittings (July 4).
Plates and Their Work (July 11).
Apparatus Repairs and Renovations (July 18).
Posing the Head (July 25).
Intensifying Portrait Negatives (Aug. 1).
Workshop Jobs (August 8).
The Personal Factor (Aug. 15).
The Keeping of Negatives (Aug. 22).
Reduction of Negatives and Prints (Aug. 29.)
Leaky Roofs (Sept. 5).
Blinds and Curtains (Sept. 12).
Miniatures (Sept. 19).
Printing Portrait Negatives (Sept. 26).
Wedding Groups (Oct. 3).

COMBINATION PRINTING.

It is sometimes necessary to combine portions of two or more photographs to form one print. Although rather troublesome work, it is usually fairly remunerative, and if properly done adds to the prestige of the photographer in the eyes of his patrons. Perhaps the most usual job is inserting an extra figure in a group, and next to that the addition or substitution of a background to a figure, building, or other object. With the general adoption of bromide printing the older style of printing by means of a careful system of masking the negatives has almost fallen into desuetude, but at one time very fine examples were shown by the late H. P. Robinson, Robert Slingsby, and many others, the earliest practitioner, probably, being O. G. Rejlander, whose celebrated allegory "The Two Ways of Life" was printed on one sheet of paper from no fewer than forty different negatives. I possessed a copy of this picture, now, unfortunately, faded to invisibility, and can certify to the complete success of the method. It is hardly necessary to say that this process can only be carried out upon a printing out paper on which the image is fully visible, so that the masks can be properly adjusted. A hint by Mr. Robinson worth repeating is that, if possible, joins should not be made on the outlines of figures; this, however, can rarely be acted upon unless the original negatives are specially made with this end in view.

An easier method, and one which I have employed with considerable success, was introduced by Mr. T. Edge. It is especially useful for small work, and only requires a steady hand and a little skill in using a sable brush. The procedure is as follows:—Supposing it is wished to place a landscape background behind a figure taken against a brick wall, the background in the figure negative is very carefully blocked out with opaque, so that it will print with a perfectly white background. A print is made upon a printing-out paper, either gelatine or collodion. (I have used most brands of P.O.P. as well as Seltona and Paget Self-toning.) The figure if small is carefully painted over with gamboge water-colour, so that all light-action is obstructed, care being taken to keep very exactly to the outline of the subject. When dry, the figure is adjusted in the desired position upon the landscape negative which is to form the background, and this is printed to its proper depth, taking care that it is rather on the light side. All that has now to be done is to wash off the gamboge with plenty of clean water and to tone and fix in the usual way. No other colour than genuine gamboge is suitable, as not only does it leave no stain upon the paper, but it has no effect upon the unfixed image. It is, of course, necessary to paint the image over by artificial light or to use a yellow blind with daylight. If large images have to be dealt with only about a quarter of an inch margin need be "gamboged," the remainder being covered with an opaque paper mask, which may be attached to the negative with a touch of rubber solution. It is manifestly impossible to employ this method with bromide paper for contact printing, but a modified form may be used for enlargements.

The figure negative, having been blocked out so as to print with a white background, is placed in the enlarger and focussed to the desired size upon a piece of card, upon which the outline is carefully traced in pencil. This is accurately cut out and fixed upon a sheet of glass at least as large as the finished enlargement is to be. The bromide paper is next pinned up and an exposure made for the figure. This is developed with a rather weak developer, until the outline is clearly visible, and well rinsed. Meanwhile, the landscape negative is put into the enlarger with the yellow cap on; the faint image is now pinned up so that it comes into its correct position on the background, and the mask (supported on the glass) fixed up so as to protect it. There should be a slight distance between the glass and the paper so as to avoid a sharp join. The exposure having been given for the landscape, development proceeds as usual. Some practice is necessary to ensure good results and great cleanliness is needed to avoid stains. Test exposures must be made for both figure and background negatives, so that the depth of colour is evenly balanced in the combined print.

The insertion of skies and foregrounds is a more simple matter, as these may be vignetted in by means of masks cut approximately to the desired outlines. If pencil marks are made on the margins of the bromide paper to show how far the foreground and sky negatives are to be allowed to cover, it will not be found necessary to develop the print partially as a guide. If preferred, push pins may be used to mark the limits of the various exposures, but I favour the pencil marks, as it is sometimes necessary to shift the paper on the easel in order to bring the required portion of the sky into position.

The most generally practised method of combination printing is what may be called the patchwork way. This is both easy and efficacious, as there is no question of registration. Let us suppose that an additional figure is to be introduced into a group. The first step is to make a print of this figure exactly the correct size to range with the other members of the group This is then cut out with scissors and pasted into position on the group print. If the cut edges show as white lines they must be darkened with a little spotting colour. The next step is to copy the whole thing, and to make the final prints, either by contact or in the enlarger from this negative. I have made a little modification in this process which I think has some advantages. After cutting out the figure which is to be added I soak it and the group in water until quite limp, place them together in position, and then squeegee down upon a clear piece of glass. By doing this any unevenness of surface is avoided and the join is much less in evidence; there is also a great saving in time, and no cardboard is needed for mounting. It may perhaps be useful to give details of an actual job. I received a postcard film negative of a lady reclining in a bathing dress, and an engraving showing a somewhat similar female on the edge of the surf with huge waves breaking a little further back. My task was to produce a similar effect in whole-plate size from the film negative. Fortunately a number of negatives of waves were available, and I easily found a suitable one. From this I made a 12 x 10 bromide enlargement on smooth paper. Next I made an enlargement from the film on the same brand of paper. When these were dry I did what was necessary in the way of finishing with lead pencil. I then cut out the figure, soaked it and the wave picture and floated them into position under water. They were then squeegeed down face to a clear glass, and copied through the glass, the negative being the desired whole-plate. The whole operation, excluding drying, took about two hours.

Some very expert photographers manage to combine negatives by scratching a clear space upon one and transferring into this space a portion of film from another negative, the stripping being effected by means of hydrofluoric acid. While good results can be obtained in this way, it is not one for the every-day worker who wants to use materials and methods in ordinary use. Nor can I endorse the advice sometimes given to join up film negatives by cutting to shape and cementing upon glass. This method has given in my hands a more noticeable join than almost any other.

For the beginner I recommend the "patchwork way"; it is most generally employed for press work, and requires little practice to get good results.

There are various optical methods of combining figures and backgrounds which have recently been described in the "B. J.." but these necessitate special apparatus which the ordinary photographer will not find it economical to acquire.

PRACTICUS.

EFFICIENCY IN THE WORKROOM.

(*Continued from page 576.*)

When enlarging prints which require a tinted border most workers, I believe, register the print in a printing frame, arranging this in front of the easel of the enlarging apparatus.

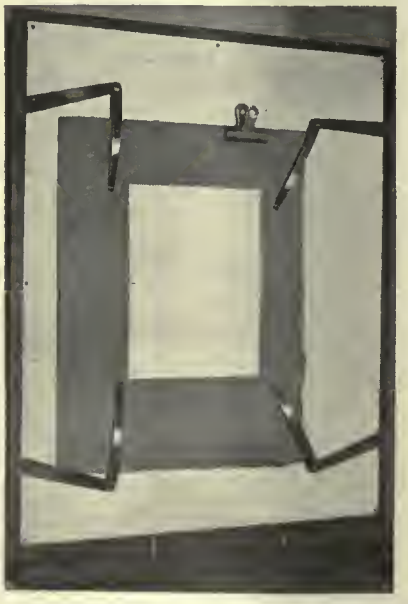


Fig. 5.—Masked enlargement-prints made by clipping mask and paper together before placing in easel.

A much simpler and quite as efficient a way is to register mask and paper in the hand, then clip both together at one end with a strong steel paper clip, placing this in position on the easel as one piece, as shown in Fig. 5. You will find that this occupies about one-fourth of the time, and I have never known it to give a false registration.

Fig. 6 shows a piece of apparatus which is a real time saver, one of my few original pieces of apparatus. It is a circular revolving trimming desk, and should be in every studio where large prints have to be trimmed uniform by the aid of a glass-cutting shape. The construction is as follows:—A crosspiece

Fig. 6.—Revolving desk for saving time in print-trimming.

of wood with an iron pivot in the centre, and four small rollers at each extremity, to insure smoother rotation, forms the base.

The desk itself is circular, about one inch in thickness, made of white pine with the grain crossed, and covered with thin

Fig. 7.—Construction of parts of the desk shown in Fig. 6.

sheet zinc, this metal being about the best medium for a trimming surface. Underneath the circular top piece, in the centre, is the iron counterpart of the base pivot on which it revolves. (Fig. 7.) The size of the desk I use is 24 inches in diameter, but,

of course, it could be made any size, according to the various needs of those who use it. Its chief advantage lies in the fact that you remain in one position whilst trimming, instead of having to lift your desk around or walk around the print. It requires practically no effort to revolve the print or to stop it just where required. I have been using this desk for over three years with great results, and, by actual count, it saves just one-half of the time on the old method.

A piece of apparatus which I designed for hypo-alum toning is not particularly wonderful, nor perhaps original, but is certainly very efficient. I have a double boiler arrangement in common with most studios. The stand is made entirely of iron and sheet tin, eliminating all danger of fire. There are four iron legs, three ventilated sides, and an iron door in front. About six inches under the tank which contains the jacket of water are four fairly large gas burners, capable of raising the bath to the required temperature in about ten minutes. This piece of apparatus, whilst simple, has many advantages. It can be placed in some corner of the building where the odour cannot permeate the rest of the studio. Its construction is too simple to get out of order, yet it is the most efficient thing for sepia toning that I have come across.

Not every studio gives the thought and time to the retouching equipment that this very important branch of the business deserves. But all studios are very careful to expect and demand the best of their retouchers, no matter the conditions under which they work. In many cases the retouching has to be done in some little hole of "sardine-like" space. I know of one instance where the retoucher has to work so close to the roof of the building that if he should forget himself and stand up, the contact of roof and head would severely remind him of his mistake. Also, how many desks are put together so temporarily that a good sneeze would blow them over? The conditions are immaterial, we say, so long as the work comes through.

But with a retouching desk that is clean and substantially built, and with working conditions as comfortable as circumstances will permit, the negatives arranged in convenient shelves close at hand, you eliminate the former handicap, and your retoucher cannot but give you the best that is in him. These few points are very essential, as faulty retouching is responsible for many unsatisfactory pictures, and no workman can give you his best unless he has full help from his apparatus.

The desk which Fig. 8 describes costs only a few shillings, and a few hours to build. It is substantial, clean, and allows

Fig. 8.—Bench of retouching desks, with shelves above for negatives, etc.

plenty of working room. It consists of two lengths of ten-inch board fastened together, with convenient openings for negatives. This is placed at the required angle on a baseboard about 18 inches from the wall and 2½ feet from floor.

Sufficient space is provided for elbow rest, and a leather strap is fastened vertically on both sides of the negative opening, and stretched as tightly as possible. If a piece of lattice wood is slipped under these two straps the negative to be retouched can be placed in any position required. These straps can also be used for holding pencils, etching knife, etc., when not in use.

There is an arrangement in connection with this desk which might be of interest to some of you, although I question whether one in a hundred would find a need for it. The arrangement I refer to is a quick method for changing a daylight desk into one for artificial light. For the benefit of those who may have a need for it I will give a brief description.

Behind the sloping desk, and fixed on the base of the retouching stand, is a double track (Fig. 9) on which runs a board with electric brass socket attached. This socket is fitted with an automatic switch. When the daylight becomes too poor for

Fig. 9.—Electric-light fitting for retouching desk.

retouching the retoucher pulls a cord to his right underneath the desk. This runs the electric bulb in the base socket along the track until the point of contact is reached. The light is then automatically switched on behind the centre of the negative to be retouched. A cord on left reverses the action, breaks contact, and prepares desk for daylight work.

I may add that I have found opal glass an excellent medium for retouching by artificial light, and, fitted to the platform, with base socket, on the same angle as the desk, is an 8 x 10 piece of opal (Fig. 10) which, of course, moves with the bulb, and is in position behind negative when light is on.

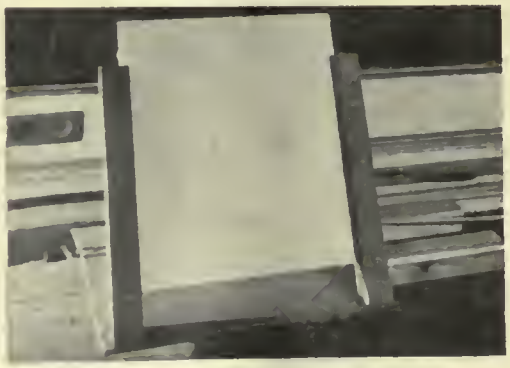


Fig. 10.—Opal-glass diffusing screen shown for the fitting of fig. 9.

Mounts, and their keeping, is a vexed question with some photographers. Many a mount salesman owes a big sales report to the fact that photographers have over-ordered, because, owing to systematic arrangement of the mounts, they were not aware of being over-stocked in some lines. System in keeping mounts is very important. We keep each line of mounts together—in their boxes—and in cupboards with doors that are always closed. Cleanliness with mounts is also an important point.

In connection with this subject of mounts, I am illustrating a mount chart (Fig. 11) which is simplicity itself, and which will be found an infallible guide to the number of mounts in stock. The first column of this chart contains a description of the mounts in use, their size, colour, etc. Each size, each colour, occupies one line.

The next column is devoted to the number of mounts in stock say, since January 1, when inventory is taken. Now if the finisher will carry out faithfully the rule to subtract from the

former total on chart the number of each box of mounts as they are opened, the last total of each mount will be the present total in stock. Thus, when the salesmen make their call, it is not necessary to take an inventory of mounts. I have only to take a glance at my chart, and I can tell in a few moments what to order, and—what is just as important—what *not* to order.

This chart will remove the anxiety of running short, and also save the frequent overhauling to see if one is sufficiently

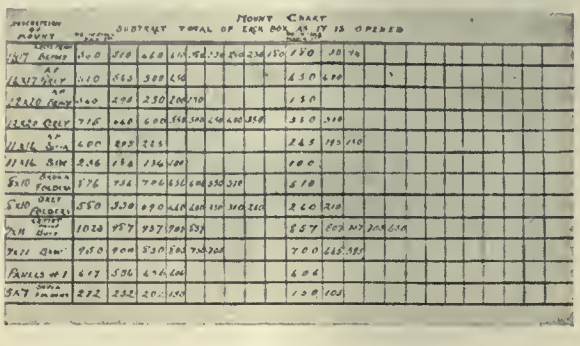


Fig. 11.—Chart for records of mounts in stock.

stocked in all lines. If kept with dates, such a chart will prove a splendid criterion of the relative popularity of the various mounts, and if one or two styles of mounts are not being used as fast as they ought, the receptionist might be asked to make a special inducement to speed up the sale of these. A separate cupboard should be used to keep mounts that are in daily use, and as each box is opened its entire contents should be checked off the chart and placed in this cupboard, and the box thrown away. This will remove the confusion of having full and half empty mount boxes stored together.

An idea which I have recently invented, with some success, greatly simplifies the process of embossing. Prints that have been printed with a tinted border are usually selected for embossing. These prints have, of course, to be registered exactly during printing, and it is upon this principle that my embossing idea is based.

HERBERT G. STOKES.

(To be continued.)

STORING SENSITIVE PAPERS.

(From "Rajar Trade Notes.")

WITH the advent of dull, damp weather we would impress upon our business friends the importance of providing for the proper storage of sensitive papers. Bromide and gaslight papers possess astonishing keeping properties if certain precautions are observed.

The careful stock-keeper who uses shelves and cupboards for the storage of sensitive papers should arrange for the papers to be placed on the lower shelves as near the floor as possible. It is asking for trouble to place them on a top shelf in a room lit by gas or warmed by a coke stove. The golden rule to observe is to keep all sensitive papers well away from the products of combustion, and in a cool, dry place.

Dampness will also cause sensitive papers to deteriorate rapidly, and in the case of bromide and gaslight papers the emulsion may become locally de-sensitised. In some workrooms a practice is made of exposing bromide prints and delaying development for a day or two, but this is a method which we do not recommend. We made some experiments in this direction, and found that bromide prints exposed one day and developed a few days later did not give anything like such good results as usual, especially those that had previously been stored in a damp place. The latent image appears to lose a large amount of the depth impressed upon it by light-action. With exposed plates and films this is not so apparent, excepting in the case of damp storage.

"Stale paper" is often the verdict given on paper that shows the characteristic discolouration of the edges, whereas the real reason is invariably "bad storage."

Sensitised plates and papers should never be stored in a room where sulphide or hypo-alum toning is done, or, in fact, anywhere near where sulphide fumes are likely to be present.

Assistants' Notes.

Notes by assistants suitable for this column will be considered and paid for on the first of the month following publication.

Self-Training in Drawing.

I SUPPOSE every photographic assistant realises how useful a little skill in drawing is to him or her. In many ways, if only a little; much more, if you attain some proficiency. Yet many say, "I can't draw at all. I'm afraid I can't learn, and there is no art school I can go to." Never mind, a beginning, if you work on the right lines, is better than doing nothing, and therefore I will try to explain how to make a start in teaching yourself.

You need not have any very expensive outfit. A fair-sized drawing board, a few pencils, drawing pins, and a few sheets of drawing paper and a piece of rubber are all you need to start with. An H.HB, B and 2 B pencil will be ample. Concluding that you know nothing of drawing, a few very simple household articles will serve excellently to begin on. Begin on a book, broadside on, standing, lying flat, turned cornerwise and edgewise. Then you can go on to a tumbler, a teacup, cup and saucer, a kettle, saucepan, watering pot, teapot, jug; and then begin to arrange these in groups of twos, threes, and so on. I may say in passing that this is actually the practice in all art schools, who long ago found that these homely models are the best. None of these need you buy, of course, and all houses contain such things as candlesticks, vases, and so forth, which again answer beautifully for both black and white work and all early stages of colour work.

In practice, stretch a sheet of paper, arrange your model, say a kettle, on a sheet of brown paper a few feet from you (if possible nearly on a level with your eyes), and start work. You can sit in one chair and rest your drawing board on the back of another, or on a chair turned upside down—this also is done in the schools. Take your H.B or B pencil and roughly tick off the size of the space you wish your drawing to fill, taking care to keep your drawing to a good large size. Now in starting to draw or paint, try hard to keep in mind one great rule; i.e., that you are out to set down on paper just what you *see*, quite irrespective of what you know to be there. This is just exactly what the camera does; therefore, if you are going to use your drawing knowledge, say, to help you work up a good big enlargement, putting in a fresh background, you have only to go to work in just the same way, and you will find that you will get along swimmingly, and not turn out those ridiculous effects one often sees in woefully cheap and poor enlargements, and which really do give one quite a bad pain even to look at.

To get your proportions, hold your pencil out at arm's length, against the model, close one eye, and mark off with the thumb the apparent measurement on the pencil. Compare the various parts one with another—you will perhaps thus find the height to be just 2½ or 3 widths—and thus you can get your proportions true. The angles made by retreating lines can be gauged by holding one pencil upright and one right across it at right angles, for retreating lines are most deceptive things.

Sometimes it is good to trace with the pencil, keeping one eye closed, the outline of the model you are drawing, for thus you will discover to your surprise how greatly the apparent shape of the model differs from the actual shape. The top of a cup and saucer you know to be round, but on tracing it you find that it has become greatly flattened, narrowed, and elongated. Well, don't worry, just set down as accurately as you can just what you find you are seeing, and you will be surprised how soon you will find yourself making quite decent recognisable drawings.

Learn above all things to *see*. Study your model carefully before putting pencil to paper. You will find that the shape, the light, and the way the light strikes all make up together the mass you see. Again, one edge is light, one edge is dark; one edge seems to

melt away, the other stands out sharp and clear. Well, this you must learn to imitate, too. You must learn to "accent," as it is termed. To do this use a soft pencil, with very light pressure at the light edges, and gradually increase the pressure where the edge is sharpest and darkest. Usually, accenting is thought to be most needed on the right-hand side, and nearest to the eye of the artist. This is, of course, when the ordinary lighting falls on the model—from above, and to the left: if the lighting is different, accenting will be needed in different parts. At any rate, a very little practice and a few trials will soon show you the difference "accenting" makes to your outline drawing. Instead of even sweeping lines of unvarying thickness you at once begin to put life and character into your drawing, and to redeem it from flatness. Study any portrait or landscape print and you will see that no matter whether studio or out-of-door lighting each photograph contains just this difference in the quality of the edges, and if you strive to match this in your working up, either on print or negative, you are bound to do good work, and your drawing be of much benefit to you.

In practice, try and make long, smooth, swinging lines on your paper; don't bore the point of your pencil into it, or you will never succeed in rubbing out any incorrect lines. First plot in lightly the proportions and outline of your drawing, then after a few minutes' rest examine critically, and if it satisfies you, go carefully over it, rounding off, accenting, and doing all you know to make it as accurate as possible. Now leave this drawing a couple of days, and then take it up again. Hold it in front of a mirror, and look carefully to see where your drawing is faulty. If possible, put it side by side with the model, stand back some few feet, and compare one with the other. Of course, if you can get some experienced person to criticise it for you, it will be even better. But do impress this on your mind from the beginning, that the only way in which anyone ever learns to draw is by making drawings, many and varied, taking all the care possible, and yet making mistakes. Don't despair; these very mistakes are the things you learn most by, for one finds that the most important things to know are what things *not* to do, and incidentally how *not* and *what* not to draw. Peg away a few hours a week; for three months will do wonders for a novice who is really in earnest.

A very useful few minutes may be spent in this way. Take an empty C. de V. plate box, or anything nearly square, hold it down below your waist, and note the true square shape of the top. Now gradually raise to above the eye level, and watch how this shape *appears* to alter. Now try a teacup in the same way. From being square, one becomes diamond shaped, and then only an outline, while the other changes from a true circle in the same manner. Of course, their real shape is unaltered, but we thus see what we should put on paper when drawing them. This is what we term "foreshortening," meaning the apparent alteration of shape as seen by the eye, and as also recorded both by the draughtsman and the camera.

When you can draw readily and easily any shape you see, try shading them. Watch through half-closed eyelids for the broad masses of light, shade, and shadow. Later, you will learn to call them high-lights, half-tone, and shadow. The easiest way to learn is to work with fairly soft charcoal, on charcoal paper with big broad touches even and steady, following with your strokes the direction in which the light falls. Then again work with a soft pencil, and then try stumping your chalk and stumps, working for smooth masses, blending one into the other as softly as possible, and watching most carefully for the high-lights and half-tones. As an additional help, these may be picked out with soft putty rubber, kneaded to a point, or with a little slip of stale bread. In this sort of work you cannot help noticing how like it is to retouching and the working up of enlargements, and this to a photographer is its great use.

Charcoal is supplied in sticks, sharpened to a point, and used in a little metal holder, for convenience and cleanliness. Stumping chalk is supplied in different colours in little glass tubes tightly corked. Stumps of assorted size, both leather and paper, are the most useful. None of these tools cost more than a few pence.

Both geometry and perspective form part of the drawing course, and though at first sight they simply bristle with appalling names, etc., taken section by section, in small doses, these resolve themselves into very useful rules, and lose all their terrors. A very useful little manual used by art schools is Carroll's "Complete Geometry for Art Students," and for perspective Denniss's "Complete Perspective Course." There are two little books some students might like in Cassell's series, "How to Draw from Models" and "How to Shade from Models," by Sparkes. Then there is the drawing manual issued from the B.J. Office, which is also excellent. There are also other books on the same subjects, but these I am not well acquainted with. Those I have mentioned are all on the South Kensington list.

If any students wish to obtain models or plaster casts (and these are most useful to study drawing of faces, eyes, ears, nose, mouth, etc.) these can be obtained from half a crown and upwards from Messrs. D. Brucciani and Co., 254-8, Goswell Road, London, E.C., who issue an excellent illustrated catalogue which will be a most useful guide as to what to order. I have, of course, been able in this brief article only to skim over the surface of the subject, but most of all I would like to impress that the only way to learn drawing is to keep on drawing. It may somehow sound formidable as I have described it, but if one or two students can work together much fun and real enjoyment may be got even out of mistakes and failures. But the first basis of black and white drawing must be well and truly laid. I have watched Royal Academy exhibitors at work oftentimes, and many people would be surprised, I have no doubt, if they could only see the care and thought expended on the first drawing, before any touch of colour is put on. Here I would like to point out that to the photographer his knowledge of drawing has to supplement the work of the camera and enlarger, and often to fill up lamentable gaps, so that to him a practical working knowledge of drawing is every whit as necessary as to the artist. Moreover, it stamps his work with an indefinable something which marks out the high-class from the middle-class assistant, and in practical results it makes quite a big difference in the number of currency notes the assistant can expect to receive yearly for his work.

G. E. H. G.

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

REFLEX CAMERAS.—No. 23,756. Reflex photographic cameras. P. G. Mason and Newman and Guardia.

PHOTOGRAPHY.—No. 23,570. Photograph and process for producing the same. T. S. Mercer.

STEREOSCOPIC VIEWING APPARATUS.—No. 23,237. Apparatus for viewing stereoscopic cinematograph, etc., pictures. A. K. Maxwell.

LENSES.—No. 23,285-23,286. Lenses. H. W. Lee and Taylor, Taylor and Hobson.

LENSES.—No. 23,726. Preparing lenses for grinding and polishing. W. Taylor.

LENSES.—No. 23,287. Lenses. A. Warmisham.

CAMERAS.—No. 23,731. Bellows cameras and fitments. T. W. V. Webb.

SOUVENIRS.—No. 23,366. Photographic souvenirs. W. Buckstone.

PHOTOGRAPHIC APPARATUS.—No. 23,555. Apparatus for photographic enlarging, printing, and copying. J. E. Bramwell.

PRINTING.—No. 23,718. Printing apparatus for production of diapositives. S. de Prokudine Gorsky.

COLOUR PHOTOGRAPHY.—No. 23,256. Manufacture of coloured photographic pictures. J. H. Christensen.

COLOUR PHOTOGRAPHY.—No. 23,531. Natural colour photography. R. Wellesley.

CINEMATOGRAPHY.—No. 23,418. Cinematograph cameras and machines. V. Keating.

COMPLETE SPECIFICATIONS ACCEPTED.

These specifications are obtainable, price 6d. each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

TELEPHOTO LENSES.—No. 132,067 (September 28, 1918). The invention relates to telephotographic objectives—*i.e.*, those in which

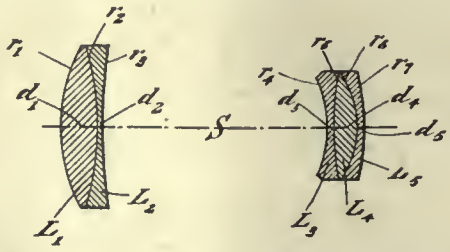
the focal length is considerably greater than the distance from the back glass to the focal plane, or the so-called back focal length. The ratio of the former to the latter will be spoken of as the magnification.

The invention consists in improvements, the aim being to obtain a large, useful field and aperture, together with greater magnification than has hitherto been obtained with good correction. The manner in which this improvement can be obtained will now be shown.

To obtain a flat field of any extent it is essential that the system should fulfil the so-called Petzval condition; that is to say, if F is the power of a lens or single surface and n is the refractive index of the glass of which the lens is made, then the sum of the quotients $\frac{F}{n}$ for all the surfaces of the system must be zero or small. In ordinary photographic lenses this sum should be a small positive quantity. In telephotographic systems it should generally be a small negative quantity. It is by making this value of suitable size that flatness of field in any optical system is arrived at. In the present case it is obtained by the choice of suitable glasses, whereby at the same time a large magnification is possible.

Other means have been used to obtain correction of astigmatism with more or less flattening of the field, such as, for example, those described in patent No. 3,096 of 1914 ("B.J.," December 4, 1914, p. 890), where the correction of astigmatism is arrived at by using an air space between the lenses of the front combination, which space can be varied till the required correction is obtained; and those claimed in patent No. 1,185 of 1914 ("B.J.," April 23, 1915, p. 273), where a less perfect correction is obtained by the use of a different set of glasses from those now proposed to be employed. In both cases the magnification does not exceed two. In the arrangement described in patent No. 19,580 of 1909 ("B.J.," January 14, 1910, p. 30), a larger magnification is attained, but with no attempt at fulfilling the Petzval condition, so that the field is small and very much curved in the sense associated with a dispersive lens; again, different glasses are employed.

Calculation shows that the ende above enumerated, *viz.*, freedom from astigmatism, flatness of field, and large magnification, together with the usual corrections of spherical and chromatic aberration on and off the axis, and coma, can be attained by, and the present invention consists in, making the front component of a telephotographic objective of a double convex crown of medium refraction and dispersion (specified herein in the usual manner of the glass makers by $N_D = 1.573V = 57.5$) with a double concave flint lens of considerably higher refractive index as well as dispersion ($N_D = 1.621$ V $= 36.1$, or, better still, $N_D = 1.652V = 33.5$), the difference of refractive index being at least .04, and preferably greater. The back component would be triple and would consist of a double convex lens of as low a refractive index as is consistent with high dispersion ($N_D = 1.55V = 45.8$) between two dispersive lenses of high refractive index and low dispersion ($N_D = 1.61$ V $= 59$), of which the inner (*i.e.*, that towards the front) is double concave and the outer is meniscus. It is essential that the lenses should have these shapes and that the difference of refractive index should be



at least .06 (or more, if any improvement in glass manufacture should make that possible). With this choice of glasses, by strict computation, it is possible to restrict the shapes so that all the glasses in each component (two in front, three in the back) shall be cemented together.

The invention will be further elucidated with the aid of the subjoined specification and with reference to the drawing, which is a diagrammatic illustration of a telephotographic objective constructed and arranged according to the invention, and showing the relative positions, curvatures, and thicknesses of the front and back components of the lenses composing the objective.

The specification alluded to is for a 12-in. lens of magnification 2.5 and aperture $f/7$:—

FRONT COMPONENT.

Radii.	Thicknesses or Separation.	Refractive Index N_D.
r_1 1.9	d_1 .36	L_1 1.573 V 57.5
r_2 3.197		L_2 1.652 33.4
r_3 8.632	d_2 .07	

BACK COMPONENT.

r_4 1.23	s 2.47	
r_5 2.9	d_3 .06	L_3 1.611 59 0
r_6 .972	d_4 .24	L_4 1.55 45.7
r_7 2.47	d_5 .06	L_5 1.611 55.0

The claim made for the invention is:—A high magnification telephotographic lens of wide aperture and large, useful field, free from astigmatism and curvature of the field as well as spherical and chromatic aberrations, by the use of cemented components of which the front is achromatised and consists of a double convex lens of medium barium crown, the index of refraction of which is 1.573 ± 0.005, and a double concave lens of dense flint, the index of refraction of which is at least .04 greater than that of the double convex lens, and of which the back, also achromatised, consists of a double convex lens of refractive index 1.55 ± 0.005 between two dispersive lenses of refractive index at least .05 higher than that of the convex lens, the outer dispersive lens being meniscus in shape. Horace Lee, B.A., and Taylor, Taylor and Hobson, Ltd., both of Stoughton Street Works, Leicester.

Trade Names and Marks.

MARKS PLACED ON THE REGISTER.

The following marks have been placed on the register:—

ARISTO.—No. 391,378. Photographic papers. Kodak, Limited, Kodak House, Kingsway, London, W.C.2.

CHRISTMAS POSTCARDS.—Messrs. Criterion, Ltd., Stechford, Birmingham, remind us that they are issuing Christmas greeting sensitive postcards in the various grades of their emulsions. The designs occupying the left-hand space of the face of the cards are printed without extra charge.

EASTMAN RESEARCH LABORATORY.—The temporary suspension of publication of communications representing the results of photographic research by the staff of the Eastman Research Laboratory has no doubt had its origin in the concentration of Dr. Mees and his collaborators upon problems connected with the war. That such is the case is indicated by the appearance of a lengthy paper on protective colouration as a means of defence against attack by submarines by Loyd A. Jones, of the laboratory's staff, which occupies twenty-five pages of the current issue of the Journal of the Franklin Institute.

A CALIFORNIAN SALON.—The third International Photographic Salon under the auspices of the Camera Pictorialists of Los Angeles will be held in the Gallery of Fine and Applied Arts, Museum of History, Science and Art, Exposition Park, Los Angeles, California, from January 3 to 31, 1920. The aim of the Salon is to exhibit only that class of work in pictorial photography in which there is distinct evidence of personal artistic feeling and execution. All work submitted to the jury of selection will be carefully and impartially considered, but no picture will be eligible which has been previously exhibited in Los Angeles. All pictorialists are cordially invited to contribute. Address all correspondence and entrance fee to Ernest Williams, Secretary, Room 31, Walker Auditorium, Los Angeles, California.

FORTHCOMING EXHIBITIONS.

September 13 to October 11.—London Salon of Photography. Hon. sec., 5a, Pall Mall East, London, W.C.1.

October 13 to November 29.—Royal Photographic Society.—Entries close September 19 (carrier), September 20 (hand). Secretary, J. McIntosh, 35, Russell Square, W.C.1.

New Books.

"The Marvels of Photography." By Charles R. Gibson. London: Seeley Service and Co. 5s. net.

UNDOUBTEDLY there is a large public among those who practise photography, and equally among those who do not, which is interested in photography itself—that is to say, in its evolution and in the various applications which it has received. Obviously a book which is to make a successful appeal to a wide circle of readers requires to be written in a light and popular style, and from this standpoint one would have to go a long way to find an author better qualified for his task than Mr. Gibson, who is known also by a large number of other books in which some branch of science or industry is popularly treated. In dealing with photography Mr. Gibson has commendably kept close to its historical development. He tells us in a very conversational way of the early efforts of Nièpce and Daguerre, and proceeds then to trace the progress of photography along the lines of the discoveries of Fox Talbot and Scott Archer. In dealing with colour photography he pursues a very similar plan, and is at pains to make clear the basis laid by Mr. Ives for processes of three-colour photography. If we have any criticism to make of this part of his work, it is that we miss the names of Clark Maxwell and Ducos Du Hauron; but it must be remembered that the author's aim is evidently to promote a broad comprehension of photographic processes and the lines of their development by bringing vividly before the reader certain specific achievements which are typical of a given process or system. Thus there is the temptation—or perhaps we should say, the necessity—to steer rigidly along this course and to refrain from overloading the vessel with cargo which the more superficial reader cannot be expected to examine. One of the most comprehensive sections of the book is that dealing with the photomechanical processes—that is, with the making of line and half-tone typographic blocks and with collotype and photogravure printing processes. Even to many of those who are familiar with ordinary photographic processes these are unfamiliar realms, in the exploration of which Mr. Gibson shows himself an agreeable and well-informed companion. A chapter is devoted to the use of photography in the detection of crime and identification of criminals, whilst the last part of the book deals with X-rays, the action of radio-active substances on photographic plates, and with the marvels of photomicrography. It is within our experience that the need of such a book as this is felt by many photographers on the occasions when they are asked to give some short and popular discourse on the origin and development of the art. In cases like this the man who may know all that needs to be known about sulphide toning or tank development is hard put to it to make such knowledge of interest to a general audience. He has to go back to the early days of photography, and, moreover, has to catch the spirit of romance which is to be found in every industry or science by those who will look for it. Mr. Gibson traverses the historical field, and in this spirit, so that his book, the contents of which are taken, so we learn, from his larger and more expensive volume entitled "The Romance of Modern Photography," is just what can be recommended to those whose knowledge of photography is limited to the working details of present-day processes.

THE MARVELS OF PHOTOGRAPHY.—Our publishers inform us that they are special selling agents of the volume "The Marvels of Photography," by Charles R. Gibson, just issued. The book is sent post free, inland or abroad, for 5s. 6d. on application to Henry Greenwood and Co., Ltd., 24, Wellington Street, W.C.2.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

MONDAY, OCTOBER 13.

South London Photographic Society. "Pictorial Ideals." M. O. Dell.

TUESDAY, OCTOBER 14.

Hackney Photographic Society. Concert, under the direction of Major E. Warden Dennis.

WEDNESDAY, OCTOBER 15.

Croydon Camera Club. "Personal Practice in Lantern Slide Making." J. D. Johnston.
North Middlesex Photographic Society. "Night Photography." F. W. Horn. Outing Print Competition—Westminster.

THURSDAY, OCTOBER 16.

Liverpool Amateur Photographic Association. "Some Views on Pictorial Photography." T. H. B. Scott.
Hammersmith (Hampshire House) Photographic Society. "Rouen Cathedral." E. W. Harvey Piper.
The Camera Club. "The Importance of Photography in the War." A. Dordan-Pyke.
Richmond Camera Club. "Subjects and Their Treatment." W. Thomas.
Brighouse Photographic and Naturalist Society. Whist Drive.
Aston Photographic Society. "Developing." F. W. Cartes.

FRIDAY, OCTOBER 17.

South London Photographic Society. Red Book Night. R.P.S.

Commercial & Legal Intelligence.

LEGAL NOTICE.—Notice is given that the partnership between Percy Joseph Coles and William Arthur Crane, carrying on business as commercial and architectural photographers at 46, Imperial Buildings, Dale End, Birmingham, under the style of Coles and Crane, has been dissolved by mutual consent as and from September 1 last. The business will in future be carried on by Percy Joseph Coles, at the same address.

NOTICE of intended dividend is given in the estate of Henry Arthur Yvery Heathcote (described in the Receiving Order as Arthur Heathcote), photographer, 22, St. James' Street, Piccadilly, W., and lately carrying on business there. Proofs must be lodged on or before October 11, with Henry Fraser, chartered accountant, 1, Guildhall Chambers, Basinghall Street, E.C.

NEW COMPANIES.

MEADOWS OPTICAL CO., LTD.—This private company was registered on September 25 with a capital of £5,000, in 4,000 8 per cent. cumulative preference shares of 5s. each and 4,000 ordinary shares of £1 each. To carry on the business of manufacturers of and dealers in all kinds of scientific instruments, optical materials, photographic requisites, and engineering instruments, etc. The subscribers (each with one ordinary share) are:—H. W. Meadows, 62, Pemberton Gardens, Upper Holloway, N.19, optician; H. H. Meadows, 79, Ealing Road, W., optician. The first directors are: H. W. Meadows and H. H. Meadows (managing director). Qualification, 1 share. Registered office: 188, Junction Road, Upper Holloway, N.19.

News and Notes.

OSRAM HALF-WATT LAMPS.—The General Electric Co., 67, Queen Victoria Street, London, E.C., sends us a schedule showing the reduction just made in the prices of half-watt lamps. The 1,000 c.p. half-watt has now been reduced in price from £2 to £1 10s. A folder issued by the General Electric Co. shows the powers and voltages of the full series of half-watts which are obtainable.

A BARNET OUTLOOK.—A four-page circular just issued by Messrs. Elliott and Sons, Ltd., and addressed to professional photographers, contains a reminder that the firm's manufacturing staff have now returned to their old posts from service in the army, and that the company has been strengthened by the appointment to the commercial side by Mr. F. W. Greenwood, who will assist his father, Mr. F. E. Greenwood, in a vigorous campaign of improvement and extension of trade.

The City Sale and Exchange has just issued from its latest branch—namely, that of 105, Cannon Street, E.C.—a forty-four page list of secondhand apparatus of all descriptions, including a great variety of vest-pocket and reflex cameras, focal-plane cameras, roll-film and other hand cameras, in addition to the larger items of equipment in the way of field and studio cameras and enlargers principally required by professional photographers. This list may be obtained from the branch, opposite Cannon Street Station, or by postal application.

Photographic Detection of Camouflage.—A paper by Mr. H. M. Stillman, before the American Physical Society, describes a method worked out for detection of camouflage. The method consists of making two negatives of approximately equal density of the group of objects, one before the change, the other after the change, printing a positive from one of the negatives, and then superimposing this positive upon the other negative. When these photographs are properly made, those parts of the picture which have not changed in the interval between exposures will show up as a field of practically uniform density, while the changes are clearly shown up by a considerable departure from this uniform density. When it is impracticable to make the scale of the original negatives the same, as in aircraft work, results can still be obtained by enlarging or reducing, by matching the negative with the projection of the positive, or vice versa. This method has long been in use in astronomy for the detection of variable stars. It was independently devised by a member of the Bureau of Standards staff and developed for camouflage detection, engineering, and other purposes in co-operation with Captain H. E. Ives, of the United States Air Service.

Correspondence.

**** Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

**** We do not undertake responsibility for the opinions expressed by our correspondents.*

A DRYING CABINET FOR NEGATIVES.

To the Editors.

Gentlemen,—*Re* your article in the B.J. Almanac, 1918, p. 256, I have had serious mottling through irregular drying, but since reading your article have made a cabinet with great success. On top of cabinet I used an old incubator kerosene lamp. I covered it with a kerosene tin and piece of 3in. downpipe soldered on. Although I put in plates at bottom to warm the air, I have found it unnecessary to use them, as without touching negatives with a cloth or chamois, merely shaking vigorously, they dry perfectly and evenly in from 1½ to 2 hours, and this with cabinet on a verandah with outside temperature registering 10° of frost.

This method never entered my head until I read your article. It is a wonder that no firm has put this simple method on the market in a practical manner.

Wishing your Almanac every success.—Your faithfully,

Jas. S. Thoneman.

Kuyura, Dalby, Queensland.
August 14.

SENSITISING CANVAS.

To the Editors.

Gentlemen,—The best method of making photographic prints on canvas (and it is really the only one known that fulfils the artist's requirements) is one practised as a secret process for many years by Mr. A. Brothers, of Manchester, and published by him in his "Manual of Photography" in 1889. The method is as follows:—The canvas is wiped free from dust with a soft cloth or a damp wash-leather; it is then coated with—

Calcium chloride	60 grs.
Methylated spirits of wine	5 ozs.

This is rubbed well into the canvas, using a pad of swansdown, continuing the rubbing until all tendency on the part of the surface to reject the solution is quite overcome and the surface is moistened quite evenly all over. Finish the drying in front of a fire or, indeed, close to any heat-source.

When dry rub over with another pad of swansdown dipped in—

Silver nitrate	320 grs.
Water	3 ozs.

When evenly coated, dry, then print under the negatives, using daylight arc light, mercury-vapour or half-watt. The exposure is fairly rapid, say, for a thin M.Q. developed negative in good daylight 10 to 15 minutes, direct sunlight 5 minutes, 3 feet away from an open arc 5 minutes, 1,000 c.p. half-watt 3 feet away 15 minutes. One deep tint on a Johnson's actinometer may also be taken as a guide for a thin negative.

When exposure is complete wash for a minute or two in running water, drain, and flood with—

Ammonia	1 oz.
Water	5 ozs.

Apply for three or four minutes, then wash again and hang up to dry.

Perhaps to many the great drawback to such a process is the fact that an enlarged negative is necessary, but if the Kodak Transferotype paper be used an enlarged negative can be made quickly and cheaply.

My plan was this:—For a canvas 24 × 20 I had a board 18 × 15 and ¾ in. thick. On this was fixed with thick glue a sheet of thick felt, edges cut flush with edges of board. This board was laid under the canvas and fitted well inside the stretcher (corner wedges being removed).

From the small negative make a transparency by contact if half-plate or less; if larger, in the camera. This transparency is placed in the enlarger and an enlargement made upon Kodak Transferotype paper the size required. This is developed, fixed, and washed, as directed in the sheet of instructions given with each packet of paper.

After the enlargement is washed it is transferred to a sheet of plate glass (in my case 21 × 17), and when dry this is used as the negative for printing the image on the canvas prepared as above stated.

This method of printing an image upon canvas is the only perfect method known. The coating on the canvas is itself sensitised, and that without disturbance or alteration, also without any film being superposed to interfere with the artist's brushes or paints.

The method of making a sufficiently good negative on Transferotype paper is simple, certain, and easy so long as the transfer to the glass is done without a preliminary drying of the enlargement. Drying always introducing an element of uncertainty as to whether the backing paper will stick tight or bring with it some of the image, but when this drying is omitted then there is never any trouble.

Once the print on the canvas has been made the negative may be scrubbed off and the plate-glass used for another.

"Old Photo."

A COMMON CAUSE OF LOSS OF BUSINESS.

To the Editors.

Gentlemen,—That haphazard methods of conducting their businesses were fairly common among photographers of the old school must be admitted, and not infrequent failures, the inevitable consequence; but that such methods should exist to-day points very clearly to the difficulty of the "photographic temperament" assimilating the stern business qualities so essential to present-day success. Consequently, the letter by Mr. W. E. Debenham pointing out cases of photographers failing to execute their orders according to promise through lack of a simple office system, creates no surprise.

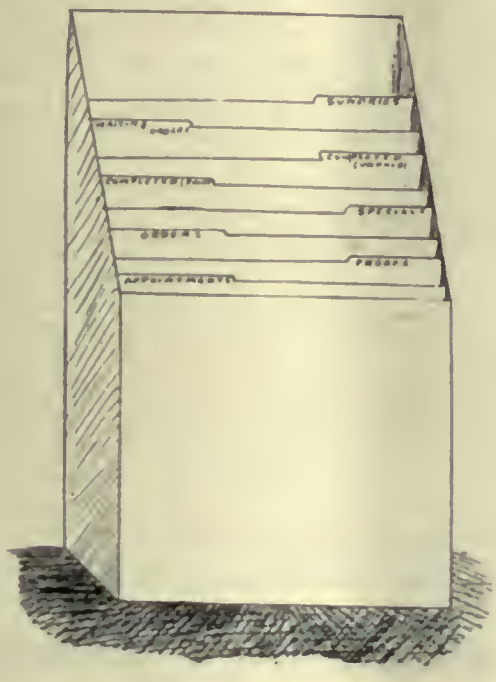
Yet why such should exist is almost beyond comprehension, as a casual glance at any photographic dealer's catalogue will reveal that all are ready to supply on demand a multiple of book-keeping and card index systems, any one of which, properly instituted, would prevent such flagrant business blunders referred to in Mr. Debenham's letter

I have had much experience of photographers' day books and

ledgers, many of which are complicated worries, others a jumbled record of words and figures, and some showing the proprietors as having a real grip of the essentials of office routine, but never once have I seen a system of books which in themselves enables one at a glance to state definitely any given order to be in a particular state of progress at any given moment.

To photographers having troubles in keeping touch with orders from date of receipt to completion I strongly recommend the introduction of the card index system, which may be supplementary to existing book-keeping methods until such time that the simplicity of the new system becomes familiar, when at least the cumbersome, useless ledger may be dispensed with.

Some years ago I experienced the worries of not keeping faith with customers by completing orders according to promise (a none too easy matter at any time where the class of work is carbon and



platinum printing), when I happened to read in the "B.J." an article strongly advocating a card index system, which I immediately adopted with the gratifying result that I was not only able to meet my customer with the pleasing reply, "Madam, your order is completed," but also able to tell in a few minutes my absolute position to the minutest detail.

In advocating this system, it is not necessarily implied that, as hereafter described, it is directly applicable in every detail to all and sundry, as in each business it will be found advisable to adjust and title each file to meet the requirements of the class of business done. Nevertheless, the system remains intact.

The matter of cost will be uppermost in adopting any system of book-keeping, but as the card index system needs but the outlay of a few shillings the cost is but a nominal one, and the storage files can be made from waste mounts and discarded plate boxes.

With a few waste mounts a box for holding daily files can be made. A convenient size would be to make a box with a sloping inner bottom sufficiently deep and wide to take cards half-plate size (as in figure).

Cut a number of pieces of card half-plate size, title them to suit your requirements, and your file is ready for use.

A stock of thin cards of *three* or more *distinct colours* should now be procured, cut an eighth of an inch smaller than the file cards, and your card system is complete.

On the making of an appointment, whether verbal or letter, the name, address, and particulars, if any, is written on top of card, and card then inserted in file marked "Appointments."

Assuming a white card is chosen, white cards are adhered to for use in the file cabinet "only."

At the time of sitting the details of size, printing, process, mounts, and all other particulars are written on card, which becomes a permanent record of customer's order. Date of proofs promised should be inserted near bottom of card, negative numbers may be written on card or at the time of numbering negatives, according to custom, the better practice being to allot negative numbers at time of sitting. Rule a line an inch from bottom of card, and in the bottom space insert the amount of order, if known, on one side and the cash payment (if any) on the other side, which constitutes a check on your cash book, and obviates the necessity of entering in detail each customer's account in cash book; the day's cash takings may thus be entered in cash book as one sum.

It should be noted that casual sitters and everything requiring proofs should be treated exactly as "appointments," as the system will explain. The card is now placed in the file marked "Proofs."

On receipt of order further particulars are written on card and date of completion promised plainly marked, also any cash payments made, the card then being filed under "Orders."

Order Card.—A second card, say yellow, bearing fullest particulars of printing and finishing is sent to the printer. The date of completion should not be stated, but a date at least one day before date promised should be very plainly marked.

Thus, the printer sorts his orders in accordance with dates, passes card, bearing date and his initials, with prints to mounting or finishing rooms, where, again, the order is noted on a list of daily orders to be completed, and according to time table the completed order is sent for dispatch.

Special Orders.—There is nothing like colour to arrest the eye, therefore the yellow card should not be used for urgent proofs or orders, but a distinct colour, pink or blue, should be used; and when the printer gets into the way of the system he will automatically observe the special colour, which gives him no excuse of overlooking a special, and the same applies to other departments. At first sight this second card may appear to be extra office work, but it is exactly the same as entering up a printer's daily order book.

On dispatch of order, if paid for, the white card may be finally filed, for which purpose old half-plate boxes may be used, marked alphabetically. The yellow card may be destroyed, or sent to printer to be stored with negative, which latter is a good plan for future reference.

Returns Book.—Should the proprietor keep a record of weekly business done, the white card is not immediately alphabetically filed, but placed in "Completed Paid File," and once a week an entry is made in the "Returns Book" either showing gross takings, from totals on cards, or set out in separate columns, headed sittings, colourings, enlargements, etc., each column being cast separate and a cross cost being carried to a totals column with a separate column for the corresponding week the previous year. The cards may then be finally filed.

This is a splendid plan, which enables a photographer easily to see what branch of his business shows paying returns, and incidentally where he may make improvements.

Completed Unpaid.—When an order is completed and the account not paid the white card is filed as "completed unpaid."

The cards, being always before the eyes of the proprietor, are a constant reminder that the accounts are to be collected. How different from a shut-up ledger!

The file "Sundries" explains itself, and the waiting order file is only a suggestion that any number of files may be made.

Enlargement, etc., should always be treated as "Orders," and filed accordingly.

Having outlined the card index system, attention is directed to the importance of its daily working.

Whoever is responsible for the office routine will at the beginning of each day examine each file, sending to the printer a list of specials, proofs, orders, etc., required for the day, which regulates the yellow card system. The printer having completed these as per prior yellow or special card, he will initial and date, and pass to finishing department, who will deliver the goods. This is the working of a simple system: all running about avoided, all bother saved, and, above all, faith kept with customers.

October 1. A. GANDY.

Answers to Correspondents.

SPECIAL NOTICE.

In accordance with our present practice a smaller space will be allotted to replies to correspondents.

We will answer by post if stamped and addressed envelope is enclosed for reply: 5-cent International Coupon, from readers abroad.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

P. E.—If you make your offer generally to the public you certainly require a licence, and if the business is in London you should apply to the Secretary (New Business Licences), Iddesleigh Mansions, London, S.W.1.

R. and Co.—The latest list of names and addresses of photographers in Great Britain is in Kelly's Directory of the Chemical Industries, published by Kelly's Directories, Limited, 182-184, High Holborn, London, W.C.2, price 25s.

J. S.—If you deal only with photographers in the way of doing printing or outdoor jobs for them and are not accessible to the public you do not require a licence, but if you put out a sign of any kind or display specimens in such a way as to invite the public, then you require a licence, which you should apply for to Iddesleigh Mansions, Westminster, S.W.1.

J. H.—1. A saturated solution of sodium carbonate is one containing as much sodium carbonate as can be dissolved in water at a given temperature. To make a saturated solution dissolve, say, six ounces of soda carbonate in 20 ounces of hot water, and let the mixture get cold. A considerable quantity of the soda carbonate will crystallise out in the solid state: the liquid part of the mixture is the saturated solution. 2. Usually we should think no extra bromide is necessary as pyro-metol works very cleanly with most plates, and tends to give very strong negatives. There may be some plates perhaps with which it is necessary. 3. You will want a wide-angle lens of about *f*/16 aperture. For a whole-plate the lens would be of from 6 to 7 inches focal length.

C. B.—Certainly; these illuminating chambers act in the same way as a reflector in daylight enlarging, and tend to give softer results, although they are of benefit where a negative is heavily retouched. They are much slower than an enlarging condensing lantern, but we should doubt if they are slower than good daylight. At any rate, they handicap you considerably in dealing with dense negatives. The only enlarger on this system which we think is really thoroughly practical for professional purposes is the high-power reflector-enlarging chamber sold by Messrs. Marion's and fitted either with high-power half-watt lamps or arc lamps. The small illuminators with incandescent gas burners or comparatively low-power electric lamps are unsuited to professional work. We would sooner use a condenser lantern fitted with a "Howellite" incandescent gas burner or else with a "Luna" lamp of Messrs. W. C. Hughes burning methylated spirit. Even if you use a condenser, you can diffuse the light with ground glass when working from negatives with a lot of retouching on them.

A. G.—1. If you cannot use either gas or electric light, the illuminating attachments sold for use in using an ordinary camera as an enlarger will not be very much good to you, because you will not be able to get oil lamps of sufficient power to use in it. Even if you can get incandescent gas burners or fairly high-power electric lamps, these illuminators are less efficient, particularly with negatives of rather great density, than the ordinary enlarger fitted with a condenser. 2. There is no fixed relation between the Watkins' speed figures and the H. and D. numbers, as marked by makers on plate boxes. You had far better stick to Watkins' numbers, which are reasonably correct. 3. Mercury vapour is a form of arc light, and requires electric current. 4. Distilled water is water made by condensing steam. By so doing all the solid impurities are left behind in the boiler. For photographic purposes ordinary good tap water, if briskly boiled for a quarter of an hour and then allowed to cool without shaking about, is practically as good as distilled water.

N. E.—Considering that you have a pension of £3 weekly, which would go a good way towards covering household expenses, you should be able to start in a modest way with £100. Unfortunately, we believe it is the practice of the Government to pay only for actual purchases, and these must be estimated for in advance. In some cases we have known they have actually paid the bills direct, so that this precludes you from picking up the various items by advertising, by which you would probably save money. As regards outfit, we think you would do well to secure a whole-plate parallel bellows camera with a good *f*/6 lens. This would answer well for cabinet portraits indoors and also for outdoor work. You would require a studio stand and also a tripod for outdoor work. An enlarging lantern would also be desirable, since you would save much in comparison with putting this work out. The half-watt system is most economical for lighting. You would want at least three 1,000 c.p. lamps. These are better than one 3,000 c.p., as you will get diffused light without wasting light by thick diffusers which would be necessary with one lamp. Much depends upon whether you are handy with tools and can fit up your own backgrounds, reflectors, diffusers, and much of the dark-room fittings. From enquiries we have made we find that second-hand apparatus of good quality costs about full pre-war list prices. In the case of good lenses probably a little more. For example, a camera and lens of the quality you require would cost about £25, and another £5 would be necessary for the studio stand. The enlarger for half-plate negatives would cost at least £12. The half-watt lamps and switches, etc., about £10. Say £5 for backgrounds, another £5 for dishes, dark-room lamp, measures, stoneware sink, etc., and about £5 for a small supply of plates, paper, chemicals, mounts, etc. It is impossible for us to say what it would cost for blinds, decorations, and showcase, if needed, as prices vary and much depends upon the premises. Comparatively few things listed in pre-war catalogues are obtainable, and the prices prevailing are usually 75 per cent. to 100 per cent. up, so that it would be close work to cover these items with the balance of the £100.

The British Journal of Photography.

Line Advertisements.

Charges for Insertion.

Since advertisements cannot be inserted until fully and correctly prepaid, senders of line announcements are asked to bear in mind the scale of charges. They will thus save themselves delay in the publication of their announcements. A Schedule by which an advertisement can be correctly priced will be sent on request.

Net Prepaid Line Advertisements.

12 words or less 1/-
Extra words ... ... 1d. per word.
(No reduction for a series.)

Special Note. Box Number Advertisements.

"Box No." and office address ... ... charged as 6 words.
For forwarding replies add ... 6d. per insertion for each adv't.
If replies are called for this latter charge is not made.

Advertisements cannot be inserted until fully and correctly prepaid.

Orders to repeat an advertisement must be accompanied by the advertisement as previously printed.

Advertisements are not accepted over the telephone or by telegram.

The latest time for receiving small line advertisements is 12 o'clock (noon) on Wednesdays for the current week's issue.

Displayed Adv'ts should reach the Publishers on Monday morning.

The insertion of an Advertisement in any definite issue cannot be guaranteed.

HENRY GREENWOOD & CO., Ltd., Publishers, 24, Wellington Street, Strand, LONDON, W.C.2.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3102. Vol. LXVI. FRIDAY, OCTOBER 17, 1919. Price Twopence.

Contents.

	Page
Ex-Cathedra	597
Methods for the Dye-Toning of Lantern Slides	598
The Exhibition of the Royal Photographic Society	599
Practicus in the Studio. By Practicus	601
Forthcoming Exhibitions	602
Efficiency in the Workroom. By Herbert G. Stokes	603
Photographic Materials and Processes. By B. V. Storr	605
New Materials, etc.	608
New Apparatus, etc.	608
Meetings of Societies	608
Commercial and Legal Intelligence	609
News and Notes	610
Correspondence— Press and Portrait Photographers—Reversal of Film Negatives—The Sale of View Postcards	610
Answers to Correspondents	611

SUMMARY.

Application forms for particulars of postal address, etc., for insertion in the "B.J. Almanac," are now with firms in the trade.

The "Index to Goods Advertised" in the "Almanac" forms a buyers' guide of special appeal to the smaller advertiser.

The concluding instalment of the paper by Mr. Herbert G. Stokes deals with the design and use of a rotating and embossing board, and describes and illustrates the method of combining portraits from different negatives into the same print or enlargement. (P. 603.)

In his article this week "Practicus" deals with flashlight work of the kind which a photographer is called upon to undertake away from the studio. (P 601.)

The exhibition of the Royal Photographic Society at 35, Russell Square, includes a somewhat small pictorial section and that, moreover, one in which landscape rather than portrait and figure work is predominant. A review of the portraiture, however, occupies the article on page 599. We shall supplement it next week by a personal impression of the exhibition, and particularly of the landscape work, by Mr. F. C. Tilney.

We reprint this week the very excellent report (for the year 1918) by Mr. B. V. Storr of progress in photographic manufacturing and working processes and in the investigation of photography on the theoretical side. (P. 605.)

A method of producing lantern-slides in a series of warm tones is that originated some years ago by Dr. Traube. In a leading article we review some of the later developments which have been worked out particularly for cinema films, but equally applicable to lantern transparencies. (P. 598.)

The death is announced of Mr. Philip E. B. Jourdain, at one time a frequent contributor to our pages on the literature of photographic processes. (P. 610.)

Dr. J. M. Eder has completed a biography of the German doctor and scholar, Schulze, for whom the credit of the discovery of photography has long—and we think, quite unjustifiably—been claimed by German writers. (P. 598.)

It is reported that the making and distribution of cinema films for school and educational use are to be financed by the Hudson's Bay Company. (P. 597.)

The special merits of the portable diffusing screen in any arrangement of studio lighting are the subject of a paragraph on page 598.

Some useful mechanical hints were given in the course of a demonstration last week at the Croydon Camera Club. (P. 608.)

EX CATHEDRA.

The Trade Directory. One feature in the "British Journal Almanac," as most photographers know, is a directory of the firms in the photographic and allied trades. Year by year this list of firms is brought up to date by revising the particulars of the postal and telegraphic addresses, and telephone numbers of each. Applications for these particulars have just been issued, and will, we hope, for the sake of avoiding unnecessary postal communications, be returned as speedily as possible. We are sometimes asked why we do not classify these firms under headings which will show the goods which they manufacture or supply. Such a scheme, however, deprives the directory of its simple alphabetical character, and in any case would lead to a good deal of duplication, even if a scheme of classification could be devised which would cover the entire production of the trade. Moreover, such an indication is given in the "Classified Index to Goods Advertised," which for some years past has also formed an important feature of the Almanac. In accordance with the scheme of its compilation, any firm inserting an advertisement (of however small a size) in the Almanac automatically figures in this Index under the heading or headings corresponding with the goods which are advertised. As may perhaps be emphasised with advantage, this is a feature of the Almanac which appeals particularly to the smaller advertiser, whose announcement obtains the same prominence in the Index as those of firms occupying much larger space. The fact deserves to be given prominence in the case of a volume in which advertisements large and small run altogether to many hundreds of pages.

* * *

School Cinema Films. We have had to wait for a long time for the cinematograph to take the important place which it deserves as a medium of education, but it would seem that it is now shortly to arrive, and will do so along a most unexpected channel. According to a notice which appeared in the "Times" of Tuesday in last week, October 7, a union of three film-producing companies is to embark on the production and distribution of films for use in schools through the financial assistance of the Hudson's Bay Company. Those who have followed the history of this chartered "Company of Adventurers" from its establishment in the year 1670, and are aware of its great land-owning and trading interests in the Dominion of Canada would perhaps be the last to expect such a corporation to embark upon such a highly modern and specialised enterprise as cinematography. Yet Sir Robert Kindersley, Governor of the Company, and perhaps better known as the head of the War Savings organisation, is an astute financier who cannot have taken up this programme without reasonable assurance of its success. We learn that there are already in the United

States one thousand schools equipped with their own cinematograph apparatus, and that most of the schools now being built embody a film-projecting installation. The new company, which is to have a capital of £500,000, includes within itself experience in the making and distribution of short films in nearly a score of different countries. It is intended that at least four educational films will be produced every week for distribution throughout the world. Evidently, although it has been long in coming, teaching by cinematograph is to be organised on the most comprehensive scale.

* * *

Diffusing Screens. We do not believe that the majority of portraitists properly appreciate the value of small translucent screens as a means of controlling the light falling upon the face. The lighting may be just what is required in all respects but one—that there is too much light upon the face. Any attempt to modify this with the blinds disturbs the scheme more or less, but if a small screen covered with thin muslin be interposed there will just be that toning down of the high-lights which gives the difference between flesh and chalk. A prevalent misconception is that the exposure is considerably increased by the use of such a screen, but upon making a trial it will be found that little, if any, additional exposure is needed to get the same degree of shadow detail, and this is quite what might be expected if we remember that the shadows are illuminated by reflected light, which is not reduced by the screen. If the light is softened at or near the glass, not only is the whole figure flattened, but the diffused light in the studio which illuminates the shadows is weakened as well. It may be well to give a word of caution against using too thick a material for the screen, and to see that it is kept reasonably clean.

* * *

Schulze and Wedgwood. We see that Dr. J. M. Eder, of Vienna, has been occupying some of his leisure during the war most unprofitably in compiling a biography of the 18th century scholar, Hermann Schulze, of Halle, whom, for many years past, he has claimed to be the discoverer of photography. It remains to be seen whether the full text of this biographical memoir adds anything to the writings of Schulze which can be quoted in support of such a claim. Apparently, from a notice of the book which has been published in the Austrian journal "Photographische Korrespondenz," it does not bring any new facts to light. Therefore it may be worth while to recall once again what Schulze did. He was experimenting on the action of heat and light on various substances, and for this purpose had made a fluid mixture in a bottle chiefly of carbonate of lime, but containing also some silver compound. He found that the white mixture discoloured, and by fixing cut-out paper patterns to the outside of the bottle he was able to convince himself quite rightly that the discolouration was due to light. In hailing this observation of the 18th century—the date of it was 1727—as the discovery of photography Dr. Eder has persistently looked at it through the spectacles of the 19th century. Schulze's memoir, an excellent translation of which was published by the late Mr. Litchfield in his book, "Tom Wedgwood: The First Photographer," comments upon the curious effect of the paper patterns being transiently copied upon his fluid mixture, but there is nothing in it to suggest that he perceived in the experiment the germ of a method of copying stencil patterns or anything else. It is plain that he was concerned with finding out by this means that the light affected his mixture. This observation having been made, he gives the bottle a shake and the patterns vanish. In interpreting Schulze's observation as the discovery of photography—a German discovery—Dr. Eder has allowed himself to be drawn from his customary habit of impartial historical judgment. If any one man can be credited with the idea of employing the action of light for representing the forms of objects and at the same time with the description of some process for carrying it out, that man is Tom Wedgwood, the third son of the famous potter. We see that Dr. Eder in his biography of Schulze is dealing with what literature has gathered around his subject. It may be hoped that he will be able to discuss the criticism of Schulze's claims contained in Litchfield's biography of Wedgwood.

METHODS FOR THE DYE-TONING OF LANTERN SLIDES.

Fortunately within the last ten years or so there has been the most marked improvement in the quality of slides used by lantern lecturers, who are themselves photographers. The old standards have passed away, and the lantern lecturer of to-day is expected to compete in a measure with the makers of prints for the exhibitions. Perhaps this higher standard of quality has come about from the exceedingly fine work of a very small circle f lantern-slide makers, among whom may be mentioned particularly Mr. Fredk. H. Evans, Mr. James Shaw, and Mr. J. Dudley Johnston. The last-named, it will be remembered, discoursed a year or so ago on the pains which he is accustomed to take to secure a certain character throughout a whole lecture set of slides, and to depart from it in the deliberate intention of producing a carefully considered degree of variety. Mr. Johnston obtains his effect by direct development, and probably if other slide-makers of equal eminence were canvassed it would be found that they also prefer this method to the many processes of after-toning, which at one time or another have come into use. Certainly the methods of producing warm tones by toning with uranium or copper have declined enormously in popularity owing to the lack of transparency which the results exhibit. Other methods, which are less open to this objection, have never come into anything like general employment, although there is much to be said for the effects obtained by the simple process of converting the black-and-white slide into an image of silver chloride, bromide, or iodide, which was worked out by the late Welborne Piper.

There is, however, another class of toning process which is coming largely into use for cinematograph film, and is equally applicable to the transparencies of the lantern-slide maker. This is the process of dye-toning, which consists in bleaching the black silver image, thereby converting it into a compound, which can mordant or "take" dye from a bath in which the bleached slides are allowed to soak. The original process of this kind was devised some eight or nine years ago by Dr. Traube, and known as "Diachrome." The ordinary lantern-slide is bleached by means of a solution of iodine to yield an image consisting of silver iodide. The silver iodide acts as a mordant towards a large number of dyes, the dye becoming more or less firmly fixed upon the silver iodide. Slides treated simply according to the process in this form show extremely pleasant tones on the projection screen. In carrying out the process no notice must be taken of the appearance of the slide, for one which is a bright red when viewed by reflected light will show on the screen as a cool brown, and the difference is just as great in the use of other dye baths. While a slide requires to be projected in order to find out what is the effect of the process, the method is extremely regular in working, and once a given bath of dye has been selected

the effect on the screen will be the same with any number of slides which are passed through it.

The presence of the iodide of silver in the image gives a softening effect, while it also adds to the opacity of the emulsion. Such slides are not very suitable for exhibition by means of a light of moderate power, but show excellently with the arc or oxy-hydrogen light. The silver iodide can, however, be removed by means of a strong solution of hypo, and if the slide has previously been passed through a hardening bath of tannin or formaline the image will be left consisting almost completely of the dye, which was attached in the first instance to the silver iodide. These dye-transparencies yield effects on the screen very different from those from transparencies containing the silver iodide. The colours are of exceptional brilliancy and purity--in fact, much too vivid and brilliant for the purposes of a lantern lecture. If used in any variety an audience is soon wearied by them, whilst the repetition of one colour becomes conspicuously monotonous. Our own feeling is that for the lantern lecturer the simpler process, in which the silver haloid is retained in the image, is much the more valuable, and is indeed one which deserves to be much more widely used than it has been. We venture to think that makers of lantern slides will find in this process, or rather in the further developments of it which we shall now pass to mention, an interesting and profitable field for experiment during the winter season which is now opening.

One of the first modifications in the Traube process was that which was the subject of a patent by the Brewster Film Corporation, whose specification was published in the "B. J." of June 8, 1917, p. 303. According to this specification the silver image may be treated in the first instance in an iodine bath, which gives a silver-iodide image of much greater transparency. The formula recommended was:—Potassium iodide, 50 gms.; iodine, 1.5 gms.; 3 per cent. solution of glacial acetic acid, 50 c.c.s.; water to make 1,000 c.c.s. Apparently, the chief difference between this bath and that of Traube lies in the much larger proportion of iodide. The same principle is adopted in compounding the bath simply from iodide, acetic acid, and bichromate, according to the formula:—Potassium iodide, 50 gms.; 3 per cent. solution of glacial acetic acid, 50 to 250 c.c.s.; 1 per cent. solution of potassium bichromate, 50 to 250 c.c.s.; water to make 1,000 c.c.s.

The process has latterly been given a different form by the two American workers, Mr. F. E. Ives and Mr. J. I. Crabtree, of the Eastman Research Laboratory, the latter of whom was the first to publish working details. It was found that the iodine can be replaced by the much cheaper bleach of copper ferricyanide (similar to the ordinary copper-toning formula of Ferguson), which gives an image of copper ferrocyanide, capable of fixing the dye in the same way that silver iodide does. The practical instructions in this process were published in the "B.J." of August 9, 1918, p. 357. Mr. Ives has subsequently worked out still another bleach yielding an image which mordants a dye. This is a solution of equal parts of potassium ferricyanide and chromic acid, the action of which can be to produce a bleached image of a high degree of transparency. A suitable bleaching bath consists of 1 oz. each of potassium ferricyanide and chromic acid dissolved in 120 ozs. of water. After bleaching, the yellow stain of the chromic acid is removed in a bath containing a little soda bicarbonate, and the remainder of the process then consists simply in soaking the slides in a bath of dye acidulated with acetic acid and in washing out excess of dye in water, likewise rendered very slightly acid with acetic acid. Considering that a considerable variety of dyes are available for these processes and the very occasional exposure to light which the toned slides receive, there is no reason for disparagement of the process on the ground of fugitiveness of the results. From the references which we have given those interested in it should find ample guidance for their experiments, and may be encouraged to extend the field of work in the direction of discovering still other bleaching solutions which may be employed to produce fixatives of dyes.

THE EXHIBITION OF THE ROYAL PHOTOGRAPHIC SOCIETY.

Portraits and Figure Studies.

The sensations in this exhibition do not lie among the portraits. There are but a hundred and twenty-four prints in the Meeting Room at 35 Russell Square, and that room constitutes the chief and largest gallery, filled with some excellent landscape work and a remarkably small proportion of portraits proper.

In our review of the London Salon we remarked upon the fact that the best of the portraiture there came from overseas. In Russell Square the examples are all of native origin. We are therefore able to get a truer idea of the British harvest than we could at Pall Mall, and on the whole we are disposed to think that the home production remains, by comparison, feeble, even when taking into account the fact that many of our best professional workers do not show here. The amateur does his best to support the nation's reputation.

The first print is "A Study in Expression" (1), by H. Lamplough jun. As we happen to know, Mr. Lamplough is quite young, and if the visitor could discount the "make-up" and the expression of the Italian-looking head before him, which is thrown back in laughter, some idea of the photographer's own physiognomy might be gleaned; for effective and convincing as is this study, it is, we understand, a self-portrait. The attempt shows enterprise and resource, and in that respect is welcome at a time when almost every aspect of a portrait but the expression seems to occupy the attention of the photographic community.

Miss Marjorie Cooke's "Portrait" (2) has claims to character rather than expression. It is simple and good in style, entirely free from any show-case attractiveness, but satisfying to the last degree. "85° F. in the Shade" (3), by Andrew Barclay, is a distinct bid, however, for the kind of approval that our "knuts" bestow on the pictures of hand-painted stockinged damsels in Burlington Arcade. It would be *risqué* but it isn't. We assume that those grave and reverend signiors who selected this innocuous naughtiness for exhibition imagined they were putting a plum into the pie of the R.P.S. We much prefer Mr. Barclay's "Plumes" (6), theatrical in subject and treatment though it be. "The Black Bonnet" (120) reminds us of the photographs of actresses which used to adorn the illustrated weeklies of a quarter of a century ago. It is very harsh in its light and shade. "Alluring" (122), on the contrary, is as flat as it could be. It represents a lady at full face with an expression

of masterfulness which only the inexperienced bachelor could deem alluring. All these works are good in their way; but it is a photographic and worldly way. The artistic charms of happy design, of effective lighting, and of quality have not proved so alluring as mere personality. Carelessness in composition may be overcome, but banality in effect and lack of quality are almost inevitable with the artificial lighting that Mr. Barclay pins his faith to. As a contrast we may turn to Mrs. Ambrose Ralli's splendidly strong example of character work called "A Sussex Type" (10). Here the light and shade is crisp and searching, and produces an effect wonderfully similar to that which distinguished the work of D. O. Hill. The face of this old man is a triumph of delineation. We could have wished, however, that Mrs. Ralli had trimmed off as much as possible of the near coat sleeve, which is exaggerated in size to the detriment of a fine picture. The comparison of these two methods of work certainly raises the question as to how far the conveniences of artificial lighting are a compensation for the loss of the natural and virile lighting of earlier methods. It is pretty certain that the masculine and forceful delineation which bright daylight, or even direct sunlight on occasion, can bring about, will exert a fascination for the public as soon as they are tired of the generalised and sweetened effects which artificial lighting seems to make for, and that period cannot be long in coming. Attempts are made, of course, to simulate the natural strength of presentment, but laudable though they be, they are still obviously not the real thing. It would seem to be artistic wisdom, at any rate, to preserve in the studio a few facilities for natural lighting, as a safeguard against an inevitable mannerism which the exclusive instalment of lighting plant must involve.

It is surprising, indeed, that the intrinsic beauties of light and shade are so rarely studied, even by the amateur who makes the quest of art his claim for using the camera. For example, Robert Chalmers's "Esmeralda" (4) is a head and shoulders with a fine sense of style, but is typical of that photographic custom of bathing a whole subject in a sort of brown sauce which robs it of all freshness and sparkle. No one denies the rather luxurious quality of this sauce at times, and particularly in this example, but it is not always enjoyable in this way. Often it is mere flatness and darkness. "The Model" (9), by Charles Borup, is what one might call "sodden" with this degradation of tone so discounting to the merits of the work. The Earl of Carnarvon shows two prints of much charm as far as their subject-matter is concerned. "Fur Cap" (7) is one of the darkest prints in portraiture that we have ever seen. It cannot be denied that modelling is here in abundance; but all the same a spectator would hardly take the trouble to follow it out did not the beauty of the face tempt and reward him in the process. We do not in actual life see things in this way as a general rule. It would be in extremely privileged and intimate circumstances that we should be permitted to examine a young lady's modelling as we may with impunity examine the modelling of "Fur Cap." "The Bird" (11) is another example almost as unreasonable. The bird is a trifling detail of taxidermy just discernible upon the lady's finger, who, herself, is really the proper claimant to the title. But the point is that her face is lit from below—a ruse that can scarcely boast the exhilaration of novelty. The lighting, however, is whispered, if one might borrow a term from another of the five senses. It is so faint that it leaves no doubt of its distant and feeble source. A lighted match would make a far more powerful display. The logical mind can only assume that this lady elected to stand almost in the pitch dark and play with a stuffed bird upon her finger. Does such an inevitable assumption increase the attractiveness of the print? Even that artistic Cardiff photographer, Hugo van Wadenoyen, jun., does not avoid the incubus of gloom in his "Portrait of a Man" (115).

This kind of work always has, and apparently always will be the dead weight on real artistic progress. There is no reason why it should exist at all. It is just as easy to make bright and lively prints as it is to produce this sodden kind of quality. A few professionals have shaken themselves free of it, but many still remain under the domination of the amateur in this respect. The amateur's part is to be artistic, of course, but too many of them postulate that the artistic is necessarily not the commonplace, and *that* they therefore avoid at all costs. But the sun is the greatest commonplace in the universe and the shadows he causes are a counterpart of his glorious revelation of form which does not take place without them. It is an ingenuous recognition of this fact that photography is in need of to reanimate it. There is in light and shade provision for all the beauties of representation short of colour; and light and shade must be accepted as they appear to the eye and the mind. They must not be subdued and "treated" until they pass beyond that point of commonplace which our experience recognises.

"Miss Queenie Thomas," in her leopard skin, by Angus Basil, shows dramatic force of design. His two nudes point to the emancipation of the public in general, and of photographers in particular. One, "Reflections" (34), however, does not seem to serve any important artistic purpose; but "Bullrushes" (37) is a well-schemed picture of a lady—or a nymph—by a stream which reflects the trees above in a happily pictorial manner.

The "Portrait Study of the Prime Minister" (12), by Miss Olive Edis, is scarcely the *pièce de résistance* of the show that it might have been. The vertical division of the face between light and shade is not quite happy. However, the portrait gives in a very life-like way the twinkle in the eyes which is the Premier's never-failing popular grace. We welcome in Mrs. Barton's "Fair Rosamund" (28) a return from her flat method to a naturalistic roundness, and think that in this respect the R.P.S. has secured her best effort. Nevertheless, we do not care for the sloping lines of the composition. Nor can we congratulate the R.P.S. upon two specimens of work sent by Chas. H. Davis from New Jersey. Both his head "Studies" (27 and 29) are commonplaces of art—not of nature. But Mr. Davis retrieves his reputation in "Mirror Portrait" (38), in which a pretty sitter looks into a cheval glass in turning her back upon us, whilst we see her full face in perfect delineation reflected. It is a nice idea, not new by any means, but managed with more success than is usual. As a photograph, Robert Chalmers's costume study, "The Snuff Box" (31), leaves little to be desired; but he should have prevented his sitter from assuming the facial expression of a music-hall singer.

One of the most important portraits in the show, at any rate as regards size, is "W. B. Ferguson, K.C., etc." (92). This is by that skilful worker, N. E. Luboshez, who carried off the palm here last year. His present contribution is not so striking a work as those of 1918, chiefly because his scheme of lighting is ineffective. But the genial Vice-President, in wig and gown, is presented with character, and the treatment is manly and straightforward, devoid of all attempts at adventitious artistry. "Beatrice Essenhigh Corke" (94) is a very charming work by Charles Borup, posed with much grace. There is grace, too, in the two heads, presumably a mother and son, of "The Kiss" (93). This is by Martin R. Tozer, who somehow has failed to endue the print with the strength it required.

We confess to liking the treatment of the head of "Hugo Van Wadenoyen, Junr., F.R.P.S." (117), about as well as anything here. It is extremely strong in presentment, yet full of *nuance*: its lighting highly effective and its characterisation interesting. It is a conquest for its author, M. R. Leeming.

The management of the backgrounds in F. Spalding, Junr.'s "Portrait, Miss S." (119), and in "The Smith" (116), by Geo. Spiers, is in neither case satisfactory. It is surely not advis-

able to put demonstrative features where they may interfere with the accents of tone in the subject. A modified background is desirable, of course, but it should not be modified into aggressiveness. Stephen W. Shore does not do himself justice in "Little Mary" (118). It is rather tame and characterless for him, who usually produces portraits of strength and meaning. C. P. Crowther had better opportunities in the smart and dashing soldier, "Un Diable Noir" (121). Here is characterisation in abundance: a fine swinging pose, well fitted to the picturesque uniform, and a handsome sitter, to whose gentlemanly bearing has been added the merest touch of the swashbuckler. Mr. Crowther also sends two of his excellent Japanese play characters, "Akogi" (the Ghost of a Fisherman) (36) and "Shakkyo" (the Spirit of a Lion) (40). Besides being remarkably fine prints, these things are intensely interesting in themselves. The masks the figures wear are wonderfully designed. In the first there is the general haggard or shrunken look of a corpse that is on the way to being a skeleton. In the other the jaws suggest the narrow but deep cavity of the lion's gaping mouth; but it is less realism than fine decorative design. "C. P. Crowther, Esq." (123), himself is the subject of an excellent print by Messrs. Millar and Scott, who also send "The Rt. Hon. the Earl of Carnarvon" (124) in a particularly free-and-easy attitude, with soft hat, very much 'squashed," and a cigarette. The last print in the room is Hugo van Wadenoyen, Junr.'s "Mr. Henry Ainley" (124a). This seems to us too large in scale and too hard in treatment to be pleasing. The light on the forehead is more like sunshine on a granite rock than a gleam upon flesh.

Figure studies that are not portraiture do not amount to much. The most pictorial are Miss Kate Smith's two outdoor figure pictures, "The Ball" (35), a diaphanously-robed nude skipping along as she tosses up a ball—technically a fine achievement; and "Arcadian Angler" (41), a pretty figure bending over the edge of a stream, and charmingly lit by gentle light from overhead. "Light and Learning" (16) is the only real sunlight portrait-study here. It represents a youngster sitting in the hall of a house with a book. The open doorway sheds a flood of sunshine upon him, and the arch of the portal forms a kind of canopy of shade on the wall behind him, and so makes some sort of a design giving the work a distinctive character. "Romany Chals" (18) will appeal to lovers of Borrow. It is a group of seated gipsies—surely a new variety of sitter. Its author, Richard Hopkins, should follow the best-looking one up for a fancy portrait of Isopel. We cannot exactly find the plurality of figures in "The Fishermen" (23), by Mr. and Mrs. F. Weston, but there is a single figure, a back view of a nude standing in the marge of the sea, and this is an excellent study, anatomically and photographically. Another nude, a young boy this time, is sent by Mrs. Maud Basil, called "Is My Parting Straight?" (37). He stands in his bedroom before his dressing-table and exhibits this concern about his hair before he has a stitch of clothing on. The print has nice quality.

Visitors will further be interested in a remarkable series of photographs taken in the South Pacific Islands by Thomas J. McMahon, F.R.G.S. They deal with the life and customs of the inhabitants that Stevenson knew. Some of the types are remarkably fine specimens of humanity, the ladies being by no means unpleasant to look upon. The ceremonial adornment of the naked males is amazing, especially when compared with a native king in full panoply of top-hat, frock-coat, and everything else of modern costume in the style of Balham at its best.

Colour transparencies are no worse than they have ever been, but there is one that deserves special mention because it is perhaps the best that ever has been in portraiture by this process. It is the production of Lucien Talamon, "Portrait de Mdlle. N." (169), and it is medalled. Finer grace and better modelling one could not hope for, and the colour of the head-dress is a triumph.

PRACTICUS IN THE STUDIO.

[Previous articles of this series, in which the aim of the writer is to communicate items of a long experience in studio portraiture, have appeared weekly since the beginning of the present year. It is not thought possible to continue the series to the length of that by the same writer which ran through the "British Journal" some years ago, but if any reader among the younger generation of photographers, and particularly those engaged as assistants, has a particular subject which might be dealt with, his or her suggestion will be welcomed. The subjects of the previous articles of the series have been as follows:—

A Talk About Lighting (Jan. 3).
The Camera and the Lens (Jan. 10).
Managing the Sitter (Jan. 17).
Backgrounds (Jan. 24).
Studio Exposures (Jan. 31).
Artificial Lighting (Feb. 7).
Printing Processes for Portraiture (Feb. 14).
Studio Accessories and Furniture (Feb. 21).
The Surroundings of the Studio (Feb. 28).
Studio Heating and Ventilation (March 7).
The Postcard Studio (March 14).
The Printing-Room (March 21).
About the Reception Room (March 28).
Home Portraiture (April 4).
Portable Studios (April 11).
Copying (April 18).
Handling the Studio Camera (April 25).
More About Lenses (May 2).
Enlargements (May 9).
Advertising the Studio (May 16).
Mounts and Mounting (May 23).
Business Methods (May 30).
Photographing Children (June 6).
Portraits of Elderly People (June 13).
Something about Lenses (June 20).
Hand Cameras for Professionals (June 27).
The Dark-Room and Its Fittings (July 4).
Plates and Their Work (July 11).
Apparatus Repairs and Renovations (July 18).
Posing the Head (July 25).
Intensifying Portrait Negatives (Aug. 1).
Workshop Jobs (August 8).
The Personal Factor (Aug. 15).
The Keeping of Negatives (Aug. 22).
Reduction of Negatives and Prints (Aug. 29.)
Leaky Roofs (Sept. 5).
Blinds and Curtains (Sept. 12).
Miniatures (Sept. 19).
Printing Portrait Negatives (Sept. 26).
Wedding Groups (Oct. 3).
Combination Printing (Oct. 10).

FLASHLIGHT WORK.

Many people attempt flash-light photography, yet very few seem to get even passable results, and, after looking at the earliest published book on the subject, that written by Robert Slingsby, about a quarter of a century ago, I feel that although considerable improvements in materials and apparatus have been made, we can show little, if any, progress in the actual photographic work. This is probably due to the fact that those photographers whose knowledge of the principles of lighting

would enable them to use the flash intelligently, do not recognise its powers, while many others who work, as one may say, blindfold, turn out the astonishingly poor work which brings discredit on the system.

The first thing which has to be realised is that flash-light is no different from any source of illumination emanating from a small area, and that practically the same effects can be produced with it as can be obtained with an enclosed arc, half-watt lamp, or even a small window, placed in the *same relative position with regard to the sitter.* Similarly, if we consider an unscreened flash as direct sunlight, we have advanced another step towards obtaining satisfactory portraits. Another important point is that the flash resembles the electric light, inasmuch as the source of illumination is comparatively near the sitter, and not at a distance of many millions of miles, as is the sun. If these elementary principles are borne in mind, the flash-light problem is much simplified. Let us now endeavour to apply them in the production of an ordinary "three-quarter light" portrait of a single figure.

Taking the first point, we find that we have to place the light high enough to give proper relief to the features, and to avoid suffusing the eyes with light. As a general rule, the light should be the same distance above the head of the sitter as it is away from him in the horizontal line—that is to say, if the stand supporting the lamp is three feet away from the sitter's head, it should be three feet above it, and so on with all other distances. This gives the orthodox light angle of 45 deg., which is what we require for this class of lighting. Excess of both front and side lighting must be avoided by placing the flash-lamp towards one side of the head, and not directly over the lens.

Next, we find that the unscreened flash gives what the daylight photographer calls "overlighting." Therefore we must interpose a diffusing screen, and, lastly, we must remember that, roughly speaking, the intensity of the light varies in inverse ratio to the square of the distance between it and the sitter, so that to avoid an excessive consumption of powder we must not make this distance too great. As in a properly arranged flash, the light produced is in direct proportion to the weight of powder burned, we see that if 50 grains of powder are sufficient to give the desired exposure at three feet distance, we must use 200 grains to get the same effect at six feet. This can easily be seen in any flash-light dinner picture wherein the distant faces are nearly black from under-exposure, while the nearest ones are more or less over-exposed.

There have been many methods of producing the flash, the oldest and safest being by igniting pure powdered magnesium by blowing it through a spirit or gas flame, and the more modern and most generally used being the firing of an explosive compound which contains magnesium by means of touch paper, some form of detonator, or an electric spark. Another way of firing is by means of a spring-driven wheel and flint similar to those fitted in the ordinary petrol lighters used by smokers.

The use of pure magnesium has almost died out, and nearly all photographers use one or other of the explosive mixtures now upon the market. Many formulæ for making these have appeared from time to time, but as I strongly deprecate their manufacture at home, I shall not give any, as I consider it as safer and more satisfactory to use one of the ready-made powders. Mixed flash powders must be treated with the greatest care, as the majority of them are more violently explosive than gunpowder, and not only severe burning of the person, but destruction of the premises, may result from incautious use. On no account may these powders be used in any form of lamp with a closed chamber, but they must always be fired in an open tray.

I have tried many forms of flash-lamps, and some of them are very good, when they work, but, unfortunately, I have never found a thoroughly reliable one yet, and there is nothing so annoying as to attempt to make an exposure on a group, and fail. I have therefore practically abandoned all mechanical or electrical contrivances, and adopted the primitive method of using touch paper, and as I always light two slips at once, I am never in doubt about the flash. My lamp is made of a sheet of tin about 15 inches square; this is bent so as to form a shallow tray about four inches wide and fifteen long, with a half-inch rim turned up all round. The remainder of the tin serves as a reflector, and has a tin loop riveted to the back, to take the end of a stout bamboo or wooden rod. This rod should be jointed, as for large groups it is often necessary to fire the flash nine to ten feet from the floor.

The method of working is, perhaps, best described by giving particulars of an actual exposure. The subject was a machine at which some engineers were working in a dark basement. The lens, a $f/4.5$ homocentric, about 7 in. focal length, working at $f/16$ for $6\frac{1}{2}$ by $4\frac{3}{4}$; flash powder, Johnson's; plate, well, there are plenty of good plates to choose from. I used one marked 275 H. and D., and it was backed. After focussing and placing the slide in the camera, I took a good teaspoonful of the powder and spread it in a long ridge along the tray. Into this ridge in two places I tucked strips of *well-dried* touch-paper, bent into a gutter shape, each with one end standing about an inch clear from the powder. The next thing was to draw the slide, uncap the lens, and apply a match to the touch paper. As soon as this was well alight the lamp was raised to a height of about seven feet, and in a few seconds the flash occurred. The lens was covered at once, and all was ready for the next subject. The negative was developed in a solution of half normal strength, to secure softness, as there is always a tendency to undue contrasts when the flash is used without a screen, which is practically always the case except in portraiture. Ample ventilation should be provided, so that the smoke from the flash will clear away quickly. The stock tin of flash powder must be covered before firing the flash, or a spark may explode the lot. More than one fatal accident has occurred in America through neglect of this precaution. There is much more to be said about flash-light, but I have reached my allotted space for this week. Studio work will be dealt with in another article.

PRACTICUS.

FORTHCOMING EXHIBITIONS.

October 13 to November 29.—Royal Photographic Society.—Secretary, J. McIntosh, 35, Russell Square, W.C.1.

November 12 to 15.—Rotherham Photographic Society. Entries close November 3. Hon. Sec., C. Robinson, 26, Broom Grove, Rotherham

November 20 to 22.—Nottingham and Notts. Photographic Society. Entries close November 8. Hon. Sec., A. Beeston, 103, Nottingham Road, Nottingham.

December 20, 1919, to January 24, 1920.—Scottish Photographic Federation. Entries close December 1. Sec.: John Macdonald, 27, Aberfeldy Street, Dennistoun, Glasgow.

EASTMAN KODAK COMPANY OF NEW JERSEY.—The directors of the Eastman Kodak Company of New Jersey have declared an extra dividend of $2\frac{1}{2}$ per cent. upon the common stock, payable on December 1 to stockholders on record at the close of business on October 31.

FINE CHEMICALS.—Those who have occasion to require pure chemical substances for experimental purposes, and may previously have regarded the German firms supplying these products as exceptional sources, should make a note of the price list now issued at frequent intervals by the British Drug Houses, Limited, 22-30, Graham Street, City Road, London, N.1. It is a most comprehensive list of organic and inorganic chemicals, of microscopic stains, aniline dyes, as well as of the photographic chemicals in common use.

EFFICIENCY IN THE WORKROOM.

(*Continued from page 590.*)

Fig. 12 shows embossing board with registration guide at left hand corner. Near the centre is a bevelled opening. The cards used for embossing are glued to a wooden block which is also bevelled so that it will more easily fit into the opening of the baseboard. The advantage of the opening and blocks is to overcome the need of separate and entire apparatus for each

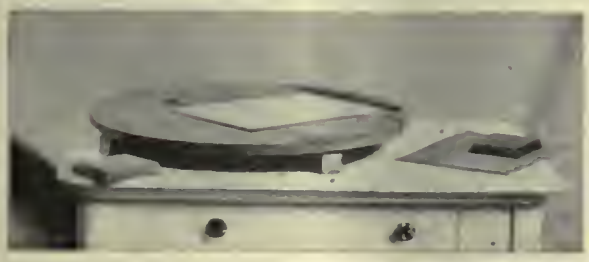


Fig. 12.—Embossing board fitted with registration guide.

different border to be embossed. The registration guide is glued permanently to the board, and all that is necessary to meet the requirements of various embossing measurements is just the addition of blocks and the different size embossing boards. Prints that have no tinted border could also be embossed by this device, provided the simple registration scheme is followed in the printing. Since preparing this embosser I have enlarged and perfected the idea by adding a rotary base board with embosser complete.

The embossing of prints is a process that many studios omit, owing to uncertain results and the length of time necessary to obtain fine accuracy. This embosser fills a need, long felt by most studios for an embossing device that will cut down time and give an accurate result. It reduces the process to a mechanical basis, saves two-thirds of the time on the old method, and makes it possible for every studio to deliver its artist proof and other style prints with a neat, accurate embossed line, which always add to the attractiveness of a picture. It is so simple in its operation that any member of the studio help can handle it without fear of spoilt prints and imperfect results, and the rotary base board enables one to remain in one position during the embossing of the four sides of the print.

Fig. 13 shows the method of changing embossing boards which accommodates the various size embossing measurements. I have

Fig. 13.—Embossing board, showing embossing block being changed.

given this apparatus exhaustive tests, and have proved beyond a doubt that for speed, accuracy, and general efficiency it is thoroughly practical.

Fig. 14 shows the operation of embossing, and Fig. 15 the method of rotating base board. It really makes embossing so simple that a child could almost handle it, because it reduces the process to a purely mechanical basis. Great care is necessary in the initial work of cutting and preparing the embossing boards, and gluing them to the bevelled blocks. One-sixteenth

Fig. 14.—Embossing the print.

of an inch makes all the difference between perfect and imperfect embossing. But once this board is fastened to the bevelled block the rest is easy. I have found that to have this embossing

Fig. 15.—Turning the baseboard.

apparatus made by a cabinet maker was too expensive for most photographers, and those who are sufficiently interested are probably aware that this apparatus is now on the market and can be obtained through any photographic dealer.

Fig. 16.—Press for flattening prints.

The press illustrated in Fig. 16 is for flattening prints of all sizes. No doubt many studios possess a similar one, and probably there are better methods of performing this necessary process; but I have found this a useful piece of workroom

accessory. It is built entirely of wood, with a base inside measurements 20 x 24, four uprights of substantial thickness, and two cross-pieces at the top. In the centre is a large wooden screw which is securely fastened to a piece of wood the same measurement and thickness as inside of base. Sixteen-ply card and blotters are interposed between the prints, and a press this size has a capacity of about 200 11 x 14, 500 8 x 10, or 1,000 5 x 7 prints. Pressure for about two hours is sufficient to insure perfectly flat prints. This press would be of no use to studios where the method of drying and flattening is performed under one process. But for those who prefer backing the prints with a weak solution of gelatine, or for studios where flattening of prints is a separate process, it will be found very handy, and it has the advantage of occupying very little space.

My final point for illustration is one that will probably interest the majority of photographers. It is a plan for saving imperfect group pictures when a re-sitting is either impossible or difficult to get. Many a pretty group has been rejected because one figure in it has either moved or wears an expression that resembles a Bolshevist outburst. Many a good order has been lost through the same cause. Briefly, my scheme is the combination of two imperfect negatives to make one perfect picture. Many articles have been published showing how this can be done through the medium of printing-out papers.

To those of you who have passed through the old daylight printing days this plan will perhaps be a familiar one. Mine is just a revival of the principle of combining two prints in one by daylight printing, using transmitted light for registration, and applying this principle to present day developing printing methods. So please bear in mind it is not the discovery of this principle, but only its application, of which I am going to speak.

Figs. 17 and 18 show the two negatives from which it is proposed to make the final print. The rendering of the two boys is

Fig. 17.

Fig. 18.

The figures of the two boys in Fig. 17 are to be combined with that of the girl in Fig. 18.

acceptable, but the little girl in the window seat, having moved, the effect as a whole is spoiled. In the other negative we have a good picture of the girl, whilst the other subjects are not so pleasing. Now, by taking the little girl from negative No. 18 and inserting her in No. 17, we get a picture which will entirely satisfy our client.

To do this, first examine negative to see the section best suited for cutting out part to be transferred, so that if a slightly imperfect registration takes place it can easily be disguised by spotting. The folds of a curtain or dress, the edge of a picture frame are outlines to be chosen when cutting. All these points will become apparent after a very little practice.

In the instance illustrated I cut through the folds of the drapery, along the outline of the little girl's leg and foot, and through the corner of room to floor. Having cut around section to be transferred I glue this section on the glass side of the negative, blocking out everything except the part to be printed. On the glass side of other negative is glued the other section. Figs. 19 and 20 will show more clearly what I mean.

Let me explain here why it is necessary for these operations to be performed on the back of negative. The thickness of the glass allows just the correct amount of softness along the edges

Fig. 19.

Fig. 20.

Part of the subject is blocked out from fig. 17. Result is fig. 19. That from fig. 18 is fig. 20.

of transfer, which, if worked from front of negative, would give us a sharp, decided outline, and also make the registration a much more exacting process.

Having arrived at this stage, we make a print first from the negative showing most of picture. The reason for this will be obvious after a little practice. Before making the exposure hold the paper in contact with the negative, and by the aid of the transmitted light of the printing machine draw a pencil

Fig. 21.—Result of combination printing from negatives of figs. 19 and 20.

line around the outline of the section to be transferred. Make the exposure of this section, then place the other negative in position, and by transmitted light register the pencilled outline with the outline of this section. Expose this, and regulate the exposure according to the relative densities of the two negatives.

The print is now ready for developing, and if ordinary care

has been taken the result should be a perfect picture from two imperfect negatives. All these elaborate and detailed explanations make this process appear one of extraordinary difficulty, but it is surprisingly simple and easy after a few attempts.

Fig. 21 is the result of these operations, and although this picture was cut and joined from top to bottom, not a particle of spotting has been employed to hide the join; proving that it is not necessary to keep an airbrush or expert artist to camouflage imperfect printing.

HERBERT G. STOKES.

PHOTOGRAPHIC MATERIALS AND PROCESSES.

In January last we reprinted the second annual report on progress of photographic manufacture compiled by Mr. B. V. Storr, M.Sc., of the Ilford Company, for the Society of Chemical Industry. This report concerned itself with items of progress which had obtained publication during the year 1917. The fact of its delayed appearance was not to be laid to the charge of Mr. Storr, since the report appeared with a score of others on different branches of technology in a single volume, and the publication of the whole was, therefore, dependent upon the receipt of "copy" from the latest of the reporters. In now publishing the report for the year 1918 we must correct the impression that there has been further considerable delay on the part of the Society of Chemical Industry. As a matter of fact, the volume of these reports for 1918 was published as long ago as March last, but escaped our attention owing to its having appeared so soon after that of the preceding year. As we would not forgo the opportunity of recording in our pages the excellent digest of many items of photographic technology which are compressed within Mr. Storr's report it is right that we should make this acknowledgment as to date both to him and to the Society of Chemical Industry. The latter, we now learn, have made arrangements whereby these annual reports will be issued immediately after the end of the year with which they deal.—EDS., "B. J."]

THE most serious of the difficulties with which photographic manufacturers in this country have had to contend during the past year has been the shortage of glass, which became so acute as to necessitate not only the still greater use of old negative glass, but the making of an arrangement by which the acceptance of an order is conditional on a supply by the customer of a proportional amount of glass. The value of such glass is much less than that of new glass, partly on account of mechanical defects, such as scratches, but more because of the difficulty of removing all stains, opalescence, etc., produced by the previous treatment. The solution of this problem has not been published, but an idea of the difficulties is given by Waggoner,[1] who found it impossible to make such glass fit for silvering either by the use of strong chemicals or even by heating to softening point. His explanation of a mechanical etching of the surface, less where the silver image reduces the intimacy of contact, will hardly cover all cases in which the surface of glass is affected as regards coating with a sensitive emulsion, and it is more probable that the porosity of the glass, as suggested by Rheinberg, is the cause of the trouble.

The supply of good photographic raw paper, in common with all papers, has been restricted, although several British firms are making excellent base. Baryta coating is being successfully done by several British firms who specialise in this, and also by several photographic paper manufacturers, amongst whom the practice of doing their own baryta coating is becoming more common.

Suitable packing papers, both for plates and for sensitised paper, have been increasingly difficult to get. Straw-paper especially, which has been extensively used for the packing of print-out-papers, has been almost off the market, and there does not appear as yet to be an appreciable quantity made in this country.

The supply of good quality photographic gelatine, both British and French, has also been short, the difficulties here being due to poor raw material, combined, in the case of those firms who have only lately taken up the manufacture, with a lack of experience, a matter in which the photographic manufacturer can give only very limited assistance (see later). It would appear, however, that with improved raw material British firms should be able to cope with British requirements both in quality and in quantity.

So far as chemicals are concerned there has been little in the way of actual shortage, although prices have been maintained at a high level. Silver, for instance, has risen from about 3s. 9d. per oz. at the beginning of the year to about 4s. 4d. The price of bromides has fluctuated considerably, and the absence of shipping facilities produced for a time a distinct shortage. A small amount of British-made bromide, presumably from American or French bromine, has been on the market, but the bulk of it has come from America. On the whole the quality has been well maintained, although somewhat greater care has been necessary in testing, and the proportion of chloride present has shown considerable variation.

The total effect of such conditions to the customer, apart from shortage owing to priority of war contracts, has been a considerable increase of price and uncertainty of supply, but with little if any reduction in quality.

The supply of subsidiary chemicals such as developing agents, sulphite, alkalis, and thiosulphate, has also been maintained, although in some cases at very enhanced prices. All the more important commonly used developers are now made in this country, and can be obtained in a satisfactory condition as regards purity. The conditions in America have been as stringent as here, and to judge from the results obtained by H. T. Clarke,[2] adulteration has been fairly common; he gives examples of analyses showing misnaming and considerable adulteration and a list of twenty-five adulterants found in various developers actually on sale.

The production of photographic dyes, more particularly of colour sensitisers, in this country is now well established. The value of this to the Royal Air Force, who used large numbers of panchromatic plates and of colour filters in their observational work, can hardly be overestimated. The range of dyes for purposes such as anti-halation plates, tinting, the making of colour filters and safe-lights, etc., is, however, still very limited, and it is to be hoped that this will soon be put on to a footing comparable with the lists issued by one or two German firms.

The general question of economy in photographic processes is one which probably needs greater consideration than it has hitherto obtained. The chief sources of waste are glass, paper, silver bromide, and nitrates. The greater part of the waste glass is washed, broken up, and returned to the glass manufacturers. A fair proportion of the waste silver is collected and sent to the refiners for recovery, but there is probably a serious source of waste in very dilute emulsions occurring in certain processes, in which the proportion of silver is so small that it cannot economically be recovered by the usual means. The value of the process of Ilford, Limited (Annual Reports, 2, 505) for the treatment of such emulsions has now been thoroughly tested and proved. A process has also been introduced in Germany[3] for treatment by metal precipitation, the metal being in the form of balls or rollers maintained in continual motion as the liquid passes through. The ordinary recovery processes also take account only of the silver and not of the bromine generally combined with it; at the present prices of bromine this should certainly be worth recovery. The gross value of the waste nitrates, the bulk of it either the potassium or ammonium salt, is also very appreciable, but its recovery is a more difficult problem because of the great dilution of the solutions; some biological method for utilisation of the nitrogen might be possible, although even that might be interfered with by the small quantity of bromide which is present with the nitrates.

The greatest source of waste, however, and that for which, as far as the writer is aware, no recovery process is in use, is probably the photographic paper—trimmings, etc.; the greater part is con-

1 *Phys. Rev.*, 1918, (11), 137; *Sci. Abs.*, 1918, (21), 206.

2 Communication from Eastman Kodak Research Laboratory *Brit. J. Phot.*, 1918, (65), 499; *J.*, 1918, 784A.

3 Ger. Pat. 302279; *J.*, 1918, 379A.

taminated with silver and is burnt in the process of extracting the silver. As photographic paper is made from the best quality rag pulp, a process which recovered that as well as the silver should be very valuable.

One of the most promising events of the year is the formation of the British Photographic Research Association, which has received the support of the great majority of firms engaged on photographic materials or accessories to their manufacture. Captain R. E. Slade, D.Sc., has been appointed director of research, with assistants, and is already at work. The council has adopted a broad outlook on the scope of the work to be undertaken, and valuable results should follow.

Negative Processes.

The chief lines on which attention is being directed are X-ray and colour-sensitised materials. In the former very little advance is evident during the past year. Messrs. Illingworth have introduced "Radioprint,"[4] a paper for X-ray negative work. Although this cannot be regarded as a general substitute for X-ray plates on account of the much shorter range and lesser detail which an image on a reflecting base must show in comparison with one on a transparent base, it offers distinct advantages for some work by reason of its greater lightness, portability, and freedom from breakage.

In the latter direction Ilford, Limited, have made a distinct advance with their new Special Rapid Panchromatic plate.[5] In spite of its high speed this plate has a better general colour-sensitiveness than has been previously obtained, and other qualities such as gradation, good keeping, and freedom from veil have not been sacrificed. Some new principle has been adopted for its manufacture, but naturally the details of the process have not been published. The mechanism of the sensitising process is a matter of considerable interest for which as yet no satisfactory explanation is forthcoming. Seyewetz[6] regards it as an accepted fact that in all cases there is the formation of a silver haloid-dye compound similar to a lake; in the case of plates treated with erythrosin, the formation of some such compound appears probable as the dye can be easily washed out from a fixed plate but not from an unfixed plate. To what extent Seyewetz has tested his statement with respect to dyes of the other classes which he mentions—triphenylmethane, acridine, quinoline, etc.—he does not state. It has also been generally assumed that a dye sensitises in the region of its own absorption, but this does not appear to have been carefully tested for at any rate the majority of sensitising dyes. The absorption is not easy to determine, since the colour of a dye solution often varies considerably with the solvent, it is not always the same in gelatine film as in water, and the colour of the dyed gelatine film itself is sometimes affected by drying conditions. The absorption would therefore need to be determined as it occurs on the sensitised plate, and this is made still more difficult in some cases—sensitol green and sensitol red, for instance—where, as mentioned by Renwick,[7] the light-sensitiveness of the dye is very much greater when in gelatine film containing silver bromide than when in gelatine film alone. There is also the further question as to whether the colour sensitising process adds to the total sensitiveness of the emulsion or transfers a part of the existing sensitiveness to other parts of the spectrum. Considerably more evidence is required on all these points before definite conclusions can be drawn as to the nature of the process, and the complete explanation is probably bound up with that of the latent image, on which subject there is still much diversity of opinion.

For special sensitising to the infra red—as low as 9600$\mu\mu$—to allow of the photographic investigation of spectrum lines of metals, the U.S. Bureau of Standards[8] found dicyanine to be the best sensitiser in spite of the chemical fog which it gives, but which for those special researches was not found inconvenient.

Processes for the after-treatment of negatives have been further studied in the Eastman Laboratory. Sheppard[9] has shown the varying activities of different samples of ammonium persulphate as a reducer to be due to the varying iron content, iron acting as a catalyst in the oxidation of silver by persulphate, as Fenton showed it to act in the oxidation of organic acids by hydrogen peroxide.

Nietz and Huse[10] have applied the work of Jones and Wilsey[11] on the spectral selectivity of silver deposits to the question of intensification. Where an intensifying process produces a colour change in the image, the full effect of this change will vary with the colour sensitiveness of the material by which it is to be tested or with the colour of the light by which it is examined. It is therefore only in the cases in which the colour of the image is unchanged that the visual intensification and the effective intensification are the same. A large number of the commoner intensifying processes were examined from this standpoint and their effectiveness determined; the results are unfortunately not capable of quite general application since the effect of an intensifier is partly dependent on the plate with which it is used, a fact which also slightly limited the scope of the investigation.

Colour Processes and Cinematography.

There is no serious advance to report in these sections. A large number of variations in detail are being constantly described and processes patented, chiefly by Americans. It is very difficult to estimate, for any one of these, what its value may be until a process actually in use embodies the detail.

Dufay[12] has brought out an improved method of obtaining a regular colour screen with very fine rulings, in which celluloid film is impressed by a lined roll at a temperature just high enough to soften the celluloid surface. Rulings as fine as thirty to the millimetre are obtained. Colouring is done by filling in the hollows with a greasy ink and staining the upper surface with an alcoholic dye solution. As the method is mechanical both for the depth of the furrows and for the staining, and as treatment of both sides of the celluloid film is possible, thus admitting of a four-colour scheme, it should be possible to get very satisfactory regular screens by this process. In other processes described there does not appear to be any actually new principle involved; they are chiefly variations in the method of combination of two or three images or of the production of a particular colour. The essential peculiarities of some of the processes are not easily seen, and in one case at least practically the same process was described by one American firm while it was being patented in this country by another American firm.

Theoretical and Experimental.

The standardisation of the measurement of the speed and other qualities of plates and papers, the desirability for which has been strongly urged in some quarters, and which at first sight would certainly appear to be a necessity, is by no means a simple problem, and it is not yet certain that it is even desirable. A paper by Huse[13] on resolving power illustrates one of the difficulties of standardisation; he shows it to be dependent not only on the plate but on the exposure, the amount of development, and the developer. He used the fan-shaped converging grating and a definite scale of reduction, and obtained results to which a numerical value could be assigned. A range of 47 to 77 is obtained by variation of the developer only. Resolving power is also dependent on the colour of the light used, a maximum occurring in the blue, a minimum in the green, and a secondary maximum in the red. This variation is in the opposite direction to that which occurs with "gamma" (steepness of gradation), in which case, according to some recent experiments in the Ilford Laboratories, the results of which have not yet been published, a maximum occurs in the green, with minimum in the red and violet. It would seem probable that the variation in resolving power is connected with the opacity of the sensitive film, which, of course, varies with the colour of the light.

Jones and Wilsey,[11] in the paper already mentioned on the spectral selectivity of silver deposits, draw attention to the importance and wider bearing of the fact which had been well known for a long time, that the printing value of a negative varies with its colour, a yellow negative giving a more "contrasty" print than one with a similar

4 *Brit. J. Phot.*, 1918, (65), 384.

5 *Ibid*, 1918, (65), *Colour Supplement*, 28; *Phot. J.*, 1918, (58), 229.

6 *Brit. J. Phot.*, 1918, (65), 514; *Ibid.*, *Colour Supplement*, 46—47.

7 Discussion after paper by Pope and Mills on "Photographic Sensitisers," *Royal Phot. Soc.*, Dec. 10, 1918 (not yet published).

8 *U.S. Bureau of Standards*, Bull. 14, 371 [*Sci. Pap.* No. 312]; *Sci. Abs.*, 1918 (21), 296.

9 Communication 60 from Eastman Kodak Res. Lab.; *Brit. J. Phot.*, 1918 (65), 314; *J.*, 1918, 607A.

10 *Phot. J.*, 1918 (58), 81; *J.*, 1918, 224A.

11 *Phot. J.*, 1918 (58), 70; *J.*, 918, 3A.

12 *La Nature*, Nov. 10, 1917; *Sci. Abs.*, 1918 (21), 58.

13 *J. Franklin Inst.*, 1918 (185), 277 (Communication 61 from Eastman Kodak Res. Lab.); *Sci. Abs.*, 1918 (58), 152.

visual gradation but which is neutral in tone. This, of course, is due to the fact that the sensitiveness of photographic printing materials lies chiefly in the blue and violet region of the spectrum, and the distribution of this sensitiveness not being the same in all papers, it follows that the sensitometric constants of a plate depend not only on the plate itself and its development, but on the printing material with which it is to be used. The importance of this aspect is more evident in problems such as the comparison of different developers, or processes of after-treatment such as intensification (*v.s.*), where the colour of the resulting image may vary considerably.

The sensitometry of X-ray materials is still in a somewhat unsatisfactory position, very little work having been published since the preliminary note by Hodgson mentioned in the last report. One aspect of the subject has been studied by Miss Allen and Laby [14] in Australia, but full details of their work do not yet appear to have reached this country. In the short outline of the scope of their paper given in *Nature* it is suggested that the effect of exposure is dependent on X-ray energy rather than on wave-length. This result is difficult to reconcile with the well-known characteristic radiations, which would have led one to expect very characteristic spectral sensitivity curves from X-ray exposures, and especially with results such as those obtained by de Broglie,[15] who, examining by photographic means the absorption spectra of a number of elements, had first of all to determine the absorption spectra of silver and bromine as shown in the plate itself in order to allow for that effect in the other spectra. With so little of Allen and Laby's paper before us it is, however, impossible to discuss it thoroughly.

The relationship of the absorption of diffusing media with thickness has been studied from a mathematical standpoint by Channon, Renwick and Storr,[16] and the results, confirmed experimentally, contradict the conclusion of Nutting ("Ann. Reports," 1, 313) that absorption in fully diffused light is proportional to thickness. Renwick has followed up the work by applying the results to a study of the behaviour of diffusing media (pigments) on a reflecting base.[17] The general expression deduced is somewhat complicated; reflection density is given in terms of surface reflection, reflecting power of the base, maximum rejectance of the medium, the thickness or concentration of the medium, and the rate at which the maximum rejectance is reached. A much simpler approximation is obtained in the case of photographic prints, with almost black silver grains with which the maximum rejectance is very small. This expression was checked by experimental observation, and the agreement found was well within the range of experimental error. The expression previously suggested by Jones, Nutting, and Mees ("Ann. Reports," I, 312), in which the reflecting power of the silver grains is neglected, is shown to be quite inadequate. The application to the general formula to black-image photographic prints is merely the simplest of the possible applications, and its scope may be extended to such cases as sensitive emulsions and coloured pigments, and even to paints, to go outside the photographic boundaries.

The density meter designed by Ferguson, Renwick, and Benson,[18] which has several advantages over previously described meters, has aroused considerable interest. It is based on the law of inverse squares, has a horizontal viewing tube, a single light-source, a horizontal table large enough to admit of the reading of any part of a half-plate, is calibrated in densities, and will admit of readings up to a density of 2.6 or probably up to 4 with the introduction of a more powerful lamp such as the Pointolite. There is also a reflector for illumination at an angle of 45 degrees on the table of the instrument, a convenient device for the measurement of reflection densities. As the accuracy of the instrument is quite equal to that of other photometers it should find considerable use if it can be produced at a suitable price.

Helmick [19] has obtained some further interesting results on the relationship between exposure and density, testing a suggestion previously made by both Abney and Kron, but without direct experimental evidence. In ordinary plate-speed and characteristic curve determinations, logarithms of exposures are plotted against densities, the exposures being varied either by a time scale or an intensity scale. Helmick has plotted densities against times in a series of exposures in which time and intensity were both varied but in opposite directions, so as to maintain a constant energy, It=constant. He finds in all cases a maximum, i.e., for any given value of the product It there is a value of I and a corresponding value of t, which gives a maximum effect on the plate. The position of this maximum varies with the speed of the plate—the slower the plate the higher must be the intensity for maximum effect.

A considerable amount of attention is being directed, in America more particularly, to the properties of gelatine from two aspects. The first is the attempt to get really satisfactory and standardised methods of determining the physical properties of gelatines. The methods [20] are based on and are largely the outcome of those which have been found most suitable for the examination of glues. Apart, however, from the fact that certain minima of strength—setting-power, viscosity, etc.—are necessary and that a stronger gelatine is easier and more economical to work, it is the writer's experience that the physical properties are a very insufficient guide to the suitability of gelatine for making photographic emulsions. There are certain chemical differences between different types of gelatine and even between different batches of the same type, which are more effective than are the physical properties in determining speed, freedom from fog, and such qualities in different types of emulsion. As to the exact nature of these chemical differences there are very few available data, but it is very possible, if not probable, that they are due to the presence or absence of very small quantities of specific substances, rather than to variations in the proportions of the main constituents of the gelatine. A process such as washing the gelatine, for instance, will improve it for some purposes and spoil it for others. The final test of the photographic manufacturer is therefore in the particular emulsion for which the gelatine is required, and the safeguards of the gelatine manufacturer are care in selection of raw material and in its treatment.

The second aspect of the properties of gelatine is being considered largely from a biological standpoint, with the aim of assisting in the elucidation of life-processes. Some of the results have, however, considerable interest to the photographic industry. An instance of this may be cited in the results of Loeb,[21] with which should also be considered the work of Fenn[22] on the precipitability of gelatine by alcohol and the effect on that of acids, alkalis, and salts, that of Fischer, Hooker, and Coffman[23] on the swelling of gelatine in polybasic acids and salts, and that of Sheppard and Elliott [24] on the swelling of gelatine in acids and alkalis, and the occurrence of reticulation in gelatine films. Loeb demonstrates the existence of gelatine compounds of the type gelatine-Na (sodium gelatinate) and gelatine-Cl (gelatine chloride) which are produced by the action of salts, acids, and alkalis, the properties of the compounds being strongly affected, however, by excess of reagent. For instance, if powdered gelatine is treated (*a*) with water 6 times, (*b*) with salt (NaCl) solution of $M/4$ or $M/8$ concentration 6 times, and (*c*) with the same salt solution twice and water 4 times, the amount of water absorbed is somewhat lower in *b* than in *a* but very much higher in *c* than in either of the others; the effect is permanent, the water absorptions being in the same ratio if the gelatines *a* and *c* are melted, dried, and again treated with water. The evidence points to dissociation of the gelatine-metal compound in water, which is inhibited by salts of univalent cations and much more strongly by salts of divalent cations, in proportion to the concentration of the cation. Similar results are obtained in the determination of viscosity and alcohol precipitation numbers (95 per cent. alcohol does not precipitate gelatine which has been treated with sodium chloride, and washed with water as in *c*

[14] *Nature*, 1918, (Oct. 24), 160.

[15] *J. Roentgen Soc.*, 1918, (14), 18.

[16] *Proc. Royal Soc.*, 1918, A (94), 222; *Phot. J.*; 1918, (58), 121; *J.*, 1918, 224A.

[17] *Phot. J.*, 1918, (58), 110; *J.*, 1918, 283A. [See also Briggs, "Tinting Strength of Pigments," *J. Phys. Chem.*, 1918, (22), 216; *J.*, 1918, 273A.]

[18] *Phot. J.*, 1918, (58), 155; *J.*, 1918, 283A.

[19] *Phys. Rev.*, 1918, (11), 372; *Sci. Abs.*, 1918, (21), 321.

[20] Sammett, *J. Ind. Eng. Chem.*, 1918, (10), 595; *J.*, 1918, 631A; Clark and Du Bois, *J. Ind. Eng. Chem.*, 1918, (10), 707; *J.*, 1918, 665A.

[21] *J. Biol. Chem.*, 1918, (33), 531; (34), 77, 395, 489; *J.*, 1918, 274A, 383A, 384A, 520A.

[22] *J. Biol. Chem.*, 1918, (33), 279, 439; (34), 415; *J.*, 1918, 216A, 274A, 384A.

[23] *J. Amer. Chem. Soc.*, 1918, (40), 272, 303; *J.*, 1918, 131A.

[24] Communication from Eastman Kodak Res. Lab.; *Brit. J. Phot.*, 1918, (65), 480 *J.*, 1918, 672A.

above). In the case of compounds of the type gelatine-Cl, the inhibition of dissociation by salts is determined by the nature of the anion and not by that of the cation. There is, of course, a very close analogy between the treatment of the gelatine in c and the washing of an emulsion or of a film to remove excess of salts, one of the commonest of photographic processes.

B. V. STORR.

Note.—As no attempt has been made in this report to refer specifically to every paper which has come to the writer's notice in the period covered, the following references to papers not abstracted in the Journal may be of interest:—Haines, "Cathode-ray Colours," *Brit. J. Phot.*, 1918 (58), Col. Supp., 29; Crabtree, "Dye-toned Images," *Brit. J. Phot.*, 1918 (58), 357; Ives, "Resolution of Mixed Colours," *Phil Mag.*, 1917, 18; *Brit. J. Phot.*, 1918, (58), Col. Supp. 33; Lux, "Artificial Light in Photography," *Elekt. Zeit.*, 1917 (38), 506; *Sci. Abs.*, 1918 (21), 364.

New Materials, &c.

Christmas Greeting Postcard Mounts. Sold by Houghtons, Ltd., 88-89, High Holborn, London, W.C.1.

MESSRS. HOUGHTONS send us specimens of the Christmas card mounts which they are issuing for the forthcoming season, and in which they aim to cater especially for studios supplying portraits at popular prices. In this aim, as we are glad to see, they are not afraid from striking a note of cheerful colour in the design of the mounts. All of these latter are of the slip-in pattern and consist of folders the covers of which, in most cases, bear a colour design which in its vigour challenges the quiet and neutral styles of ornamentation of which no doubt the public has had enough. Of mounts of this quite artistically festive character we may instance Nos. 903, 904, 905, 906, and 907, each quite distinctive and each supplied at the price of 24s. per gross, or 154s. per thousand. Messrs. Houghtons' selection includes others of more reserved character, such as the series of folders designated No. X901 and No. X902 in which the postcard is inserted with a touch of adhesive along one edge and which are supplied at 12s. per gross or 77s. 6d. per thousand.

New Apparatus, &c.

A New Strip-Printing Frame. Made by George S. Moore, 73, Denmark Hill, London, S.E.5.

MR. MOORE, who for some years past has been a pioneer in the design and manufacture of apparatus for strip-printing, has recently shown to us a printing frame, just introduced, which embodies his latest design, and has been worked out in order to provide the most rapid manipulation without any sacrifice of accuracy in printing the photographer's name or monogram in the case of portraits, or the title of the subject in the case of view postcards. The frame consists of a most solidly made mahogany channel midway along which are provided spaces for the subject and title negatives. The subject negative is placed in a rotating holder, so as to allow it to be adjusted perfectly straight on the postcard. It is also fitted with postcard masks. Both these adjustments—of setting square and of masking—are most rapidly made, and the negative is held in the required position simply by turning a couple of buttons. For the exposure of the six-on strip the frame is fitted with a series of stops which are found to serve with quite satisfactory accuracy in bringing the strip into position on the negative. Working from left to right, a series of eight exposures produces the six postcards on the strip, the simple release of the pressure of the hands on the spring back sufficing to allow of the bromide paper being freed for drawing forward into the next position. The work of the printer, as we have seen from a number of specimens, is most accurate, and the apparatus can be used in conjunction with the foot-pedal printing box of Mr. Moore, or, indeed, with any printing box fitted with separate device for the switching on and off of the light. Most solidly and substantially made in mahogany, the price of the apparatus is £5, carriage free.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

MONDAY, OCTOBER 20.

South London Photographic Society. "Bromoil." G. B. Clifton.
Willesden Photographic Society. "The Importance of Photography in the War." A. D. Pyke.
Bradford Photographic Society. "Artists I Have Met." B. Wood.
Dunnistoun Amateur Photographic Association. Exhibition of Carbon Prints. Autotype Co.
Dewsbury Photographic Society. "Belgium (Pre-War)." J. C. North.

TUESDAY, OCTOBER 21.

Royal Photographic Society. Traill Taylor Memorial Lecture. Rev. A. L. Cortie, S.J., F.R.A.S.
Hackney Photographic Society. Slide Competition: "Peace Celebrations and War Trophies."
Doncaster Camera Club. Lantern Lecture: "The Cornish Riviera." F. A. Jordan.
Chelsea Photographic Society. "The House Fly: Its Structure, Habits, and Menace to Health." Dr. G. H. Rodman.
Manchester Amateur Photographic Society. "Art and Artfulness in Lantern Slide Making." J. Shaw.

WEDNESDAY, OCTOBER 22.

Croydon Camera Club. "The Art of Developing." A. Dordan-Pyke.
Edinburgh Photographic Society. "The Optical Lantern." A. H. Baird.
Royal Photographic Society. "Through the Wonderland of Papua." T. J. McMahon, F.R.G.S.

THURSDAY, OCTOBER 23.

Liverpool Amateur Photographic Association. "Through Scotland with Sir Walter Scott." Major R. S. Archer.
Hammersmith (Hampshire House) Photographic Society. "Richard Jeffries—Prose Poet and Naturalist." G. Avenell.
The Camera Club. "How the Rifle Grew." Dr. S. Nathan.
Richmond Camera Club. "The Art of Developing." A. Dordan-Pyke.
Brighouse Photographic and Naturalist Society. "A Journey to Mexico and the Far West." L. Whitehead.
Aston Photographic Society. "Printing." R. J. Cooper.

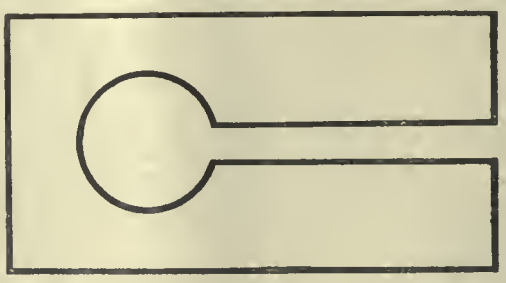
FRIDAY, OCTOBER 24.

North Middlesex Photographic Society. Annual Exhibition.
Royal Photographic Society. "The Tower of London." E. W. Harvey Piper.

CROYDON CAMERA CLUB.

MR. H. GUY JOHNSON last week gave a capital demonstration on "Workshop Aids," the main part of which bore no relation to photography. Nor did he claim anything to be new, stating that most of the "aids" were as old as the hills; but as they were fresh to many of lesser age, the demonstration lost none of its value in consequence. All learnt something.

Who has not experienced a lens cell obstinately sticking at some time or another. Here is the remedy for the evil: Take a piece of thin wood, cut out a circle a shade larger than the outside



diameter of the lens cell, and then make two saw cuts about half-an inch apart, as shown in the diagram. By inserting the lens cell in the circular aperture, and gripping the wood at the other end, the cell is firmly held, and rotating the strip of wood anti-clockways, unscrews it.

A very neat way of cutting a circular aperture in a lens panel consists in drilling a small hole right through at the centre, and then employing an "adjustable washer cutter" in an ordinary brace. At half-time reverse the wood and repeat on the other side. These cutters are handy tools for the camera craftsman, and, he said, by no means expensive. All who employ a fretsaw for the same purpose may not be aware that much stouter saws than the normal—called "power blades"—are obtainable.

Among other tips a "one drop" oil can was shown, improvised out of a tabloid bottle, with a piece of wire soldered inside to the screw-on cap. This wire is flattened at its extremity, and dips into the oil contained in the bottle, and permits of one drop of oil being placed exactly where wanted. Regarding the well-known plan of waxing wood benches to make them waterproof, the demonstrator pointed out the necessity of incorporating with the paraffin wax a small quantity of beeswax; otherwis it ultimately breaks up into small fissures, and penetration of solution occurs.

On the question of the much-debated soldering of aluminium, he said that he had found "Kayolin" quite satisfactory. The secret is to keep the wire brush (supplied with the solder) moving backwards and forwards all the time the solder is being heated until the latter flows. It was also applicable to "Duralium," a wonderful alloy, possessing valuable features in many directions. Praise was also given to "Ernoid," a substitute for ebonite, but far easier to work and capable of receiving a fine surface by polishing by hand.

The formal opening of the session took place the previous week, the president, Mr. John Keane, being billed to deliver an address. Neither he nor the secretary nor the vice-chairman turned up, and the "office boy," backed with the moral support afforded by the refreshment department, stepped into the breach with a critical review of the characteristics of the absent executive officers and old members, ostensibly for the benefit of new members, who are many indeed. Looking at his contribution in as favourable light as possible, it may be confidently stated that, if recorded verbatim, it would expose this journal to a dozen or so actions for slander.

EDINBURGH SOCIETY OF PROFESSIONAL PHOTOGRAPHERS.

The first meeting of the session 1919-20 was held on Monday, October 6. Mr. E. D. Young in the chair. The Secretary read a report on the work of the society during the past year and a-half; and Mr. Shiels, in moving the adoption of the report, made reference to the good work of the society since its inception in May, 1918. The statement of accounts was also read and adopted.

The Chairman then explained a proposal on behalf of the committee. It was felt by them that the duties of the secretaryship now being considerable it would be advisable to secure a permanent secretary, who would undertake the work in consideration of a fee or honorarium. The society's solicitor had been approached on this matter, and he had expressed willingness to undertake the duties if the members were agreeable. This arrangement, Mr. Young explained, would involve the raising of the annual subscription to one guinea, and it was proposed that the sum of a guinea and a-half should cover the subscription of a firm where there was more than one member. This proposal was carried unanimously. A point was then raised as to the voting powers of members, i.e., whether each should have one vote, or whether the arrangement should be one vote per firm. This latter suggestion was agreed upon by a majority of twelve to five.

Mr. Swan Watson, in a few words of appreciation of Mr. Young's services as chairman, moved his re-election. Mr. Campbell Harper seconded. There were no further nominations. The following members of committee were then elected:—Messrs. Campbell Harper, Bambrick, Moffat, and Miss Gray. Mr. Young thanked the meeting for electing him president for the ensuing year. He had the society very much at heart, and he hoped to see a very successful season.

A few minor alterations to the rules and constitution of the society were then proposed and agreed upon.

Mr. Young then reported on the retouching class. This had commenced most successfully on October 1, and the membership now stood at sixty-two. Mr. Young explained that he had felt somewhat overwhelmed at this unexpected number of applicants; but he hoped soon to be able to cope with the size of the class. It was possible that he might require to secure the services of an assistant. This matter would be placed shortly before the Board of the College of Art. He explained that he would seek to instruct the pupils in the sound basic principles of retouching, and it would necessarily remain for each individual photographer to guide his assistant in the particular style of work which he was in the habit of doing. It was proposed that a committee of master photographers should be appointed to look after the interests of this class, and act as a deputation to the Board when occasion arose.

Mr. Swan Watson then reported upon the decisions of his Apprentice Committee. They had agreed at present upon three main points:—

1. That an apprentice should be indentured for a period of four or five years, according to his age at the commencement of his term of apprenticeship. Thus a boy of fifteen or sixteen would serve for five years; but one of seventeen or eighteen would probably be able to cover the ground required in four years.

2. That there should be in all indentures an option on either side to break the agreement after a period of six months.

3. That the master should stipulate in each case as to the branches to be acquired during the term, stating a minimum period of instruction in operating.

Further than this the committee were unable to go in the mean time until they had acquired a more intimate knowledge of the new Scottish Education Act. On a motion of Mr. Shiels, seconded by Mr. Macalpine, the matter was remitted to the committee for further consideration and information. It was pointed out that when the new Act came into force all assistants and apprentices under eighteen would attend day classes, and, if suitable classes were not by that time organised by photographers, assistants would be compelled to attend the classes of what the authorities might consider the nearest allied trade. Such classes might not be of the value to assistants that actual photographic classes might be. Mr. Young hoped that soon a technical class on photography might be arranged.

The question of special power rates for electric current consumed by photographers was raised, and a copy of a letter was read which showed such an arrangement had been in force in Glasgow for fourteen years. Mr. Shiels proposed that a deputation be sent to the town council on this matter, and he himself hoped to be able to report in more detail at the next meeting. Meanwhile, it was suggested that the secretary might communicate with the town clerk on the subject. A discussion also took place on the question of water supply, and it was pointed out that the Trust were fitting meters to the supply where possible.

A letter was read from Mr. Scott, of Kodak, Ltd., intimating that the photographers of Glasgow wished to arrange a golf match with the Edinburgh professionals. Members were invited to go through to Glasgow for the afternoon, play a round of golf, and participate in a dinner in the evening. The photographers of Glasgow had had some idea of forming a society similar to that existing in Edinburgh, and it was suggested that this would be a suitable occasion on which to discuss the matter. Over a dozen members expressed their willingness to meet their western confrères. The question of the Edinburgh Professional Exhibition, billed for the evening, had to be held over through lack of time. The meeting then concluded.

Note.—My attention has been drawn to a recent P.P.A. handbook in which had been discovered one of those flashes of Southern humour which delight us so much by their originality—namely, a pointed sally against the "native canniness" of the Scot. I gathered from the allusion that the trait, in this instance, was exemplified by an anxiety on the part of Edinburgh photographers to send apprentices to a technical class in order to escape the burden of personal tuition. There are three known jokes south of the Tweed; and this, believed to be the most popular, has been found to possess a recurrence which may be anticipated with almost mathematical accuracy.

Pelham S. Moffat, Hon. Sec., E.S.P.P.

Commercial & Legal Intelligence.

Legal Notice.—Notice is given that the partnership between Mark Owen Athey and Charles Schofield Sykes, carrying on business as photographers at 7, Nevill Street, Southport, under the style of Athey and Sykes, has been dissolved by mutual consent. All debts due to and owing by the late firm will be received and paid by Charles Schofield Sykes.

Lancashire Society of Master Photographers.—In consequence of the railway strike the general meeting of the society previously arranged for September 30 had to be postponed, and will now take place on October 28, at 3.30 p.m., at Queen's Hotel, Promenade, Southport. The arrangements made for the previous date apply also to the postponed meeting. A social evening to which ladies are specially invited will follow the general meeting, whilst those members who can put in a day at Southport and would like a morning's golf should communicate at once with the honorary treasurer, Mr. F. Read, 14, Balfour Road, Southport, who is in charge of the local arrangements.

News and Notes.

TRAILL TAYLOR LECTURE.—The twenty-second annual lecture under the Traill Taylor Memorial Trust will be delivered at the house of the Royal Photographic Society, 35, Russell Square, London, W.C.1, on Tuesday, October 21 next, at 7 p.m., by the Rev. A. L. Cortie, S.J., F.R.A.S. Father Cortie, who is director of the Stonyhurst College Observatory, will take as his subject "Photographic Evidence for the Formation of the Stars from Nebulæ."

NOTTINGHAM AND NOTTS. PHOTOGRAPHIC SOCIETY will hold their sixteenth annual exhibition of photographs and lantern slides on November 20 to 22 next in the rooms of the Nottingham Society of Artists, 11, Park Row, Nottingham. There will be an open section in addition to that for members only, and the secretary is very anxious to have a good selection of exhibits The closing date for entries is Saturday, November 8; exhibits to be delivered on Wedday, November 12. Entry forms and further particulars can be obtained from the honorary exhibition secretary, Mr. A. Beeston, 103, Nottingham Road, Nottingham.

DEATH OF MR. PHILIP E. B. JOURDAIN.—We regret to see the announcement of the death, on October 1, at the early age of thirty-nine, of the talented Cambridge scholar, Mr. Philip E. B. Jourdain, who contributed extensively to mathematical research despite the paralytic disease which had afflicted him almost from childhood. Mr. Jourdain was also a linguist of some note, and the writer of many papers on the history of science. He showed a considerable interest in the literature of photography by his papers and translations, many of which appeared in the "British Journal" up to within some ten years ago. Thus, his notes on processes of direct photochromy, which appeared in our columns in the year 1900, form a valuable partial bibliography of this subject. He also contributed a good deal to the literature of the interference process of colour photography, and further showed his interest in the more everyday problems of photography by a series of notes on the efficiency of photographic shutters.

LECTURES ON THE SOUTH PACIFIC ISLANDS.—All those who have felt the fascination of the South Sea Islands from the novels of Jack London or the more serious pictures of island life in works such as those of R. L. Stevenson or Mrs. Grimshaw, will note with interest the series of three lantern lectures to be delivered at the Royal Photographic Society, the first on October 15 at 8 p.m., and the two succeeding on October 22 and October 29 at 7 p.m., by Mr. Thomas McMahon. Mr. McMahon is a great traveller in the islands, where he has had the opportunity of studying the native peoples most intimately. At the same time he takes a strong interest in the industrial possibilities of the South Pacific, and will have much to say on the importance of the islands to those of the English race, and will be able to show the far-reaching steps taken by the Germans before the war to secure economic supremacy in these parts of the world. The exhibition of the Royal Photographic Society, which opened on Monday last, contains a special section consisting of a large series of photographs by Mr. McMahon shewing the customs, industries, and natural resources of the islands.

THE SCOTTISH SALON.—The prospectus of the twelfth Scottish National Salon has now been issued. The exhibition will be held in the People's Palace Galleries, Glasgow, from December 20 to January 24. Our Scottish friends have considered it best to suspend the exhibitions during the war, but are now leaving no stone unturned to make the forthcoming exhibition a record one in the successful series which the past has witnessed. The entry form may be obtained from the secretary, Mr. John Macdonald, 27, Aberfeldy Street, Dennistoun, Glasgow, and must be returned to him not later than Monday, December 1. The exhibits themselves require to be addressed to the Photographic Salon, The People's Palace, Glasgow Green, Glasgow, and to arrive not later than Tuesday, December 9. An entry fee of two shillings is charged, and suffices for any number of exhibits up to a total of eight. Any further exhibits require to be entered on additional entry forms, and to be accompanied by a further remittance of 2s. for each eight exhibits or less. It should be mentioned that the Salon is limited to the work of photographers of Scottish nationality: exhibition of pictures by non-Scottish workers is a matter of special invitation. The board of selection this year will consist of Messrs. Arch. Cochrane, Alex. Keighley, and J. M Whitehead.

PORTRAITS IN WATER-COLOURS.—We recently had an opportunity of seeing a large selection of the work of Messrs. Robinson and Co., 17, 19, and 23, High Street, Harlesden, London, N.W.10, in the making of portrait enlargements finished in water-colours. Messrs. Robinson make a specialty of water-colour finishing, and in these days when so much wretched work in the way of enlargements is made, it is a pleasure to examine portraits which represent at once such a high degree of artistic taste and technical skill. The specimens which we have seen included both portraits with the customary solid background and those in the sketch style, which latter displayed to particular advantage the artistry of Messrs. Robinson's work in drawing, as well as in colouring. While their styles are most of them upon the lines familiar to photographers, we should not omit to mention a specialty of their own which they call "grey panel" effects, in which the background is a light tone of grey or buff, which, in their hands, goes exceedingly well with their colour work. These portraits impressed us as something most artistic and at the same time quite distinctive. It should be added that Messrs Robinson make no claim to be "rush" makers of enlargements; their work is turned out as speedily as its artistic character permits, and usually can be delivered within about three weeks of the receipt of the order. It is just as well that the fact should be mentioned, because we are satisfied in our minds that photographers wishing to offer their customers really fine water-coloured enlargements will have no cause to regret placing their commissions with Messrs. Robinson, whose price list, just issued, fully specifies their charges for these portraits, as well as for those in black and white and for straight enlargements.

Correspondence.

**** Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

**** We do not undertake responsibility for the opinions expressed by our correspondents.*

PRESS AND PORTRAIT PHOTOGRAPHERS.

To the Editors.

Gentlemen,—Your leading article on the professional operator and his activities, which you so naively and alliteratively refer to as the Press photographer poaching on the preserves of the purely portrait photographer, is interesting. Since you so courageously look to the interests of the P.s, perhaps you will be good enough to let me defend the Q.s.

It is perhaps unfortunate for the portrait photographer who, having struggled with his lumbersome apparatus, discovers a photographic Puck at the reception with proofs of his diligence and enterprise. But if the aforementioned Puck is poaching on other preserves, he is but returning the compliment. A visit to the art room of the newspaper any morning will assure you of the fact that sometimes the portrait man is the poacher. In any case, it seems to me that a professional photographer is entitled to widen the scope of his profession as and how he can; and there is not a lot of difference between a portrait firm running a Press department and a Press firm running a private order department.

The Fleet Street professional specialises in Press photography, but he is not obliged to concentrate on that or any other branch. As a result of his enterprise and initiative he is able to "deliver the goods" at an opportune time, and he is entitled to any requital which comes his way. As you say, the *modus operandi* of the Fleet Street man is not denied the portrait photographer, although it is to be admitted that a man who rolls up at an appointment three-quarters of an hour late would probably view the necessity of adopting such hustling methods with no little trepidation. With the customary enterprise of the portrait photographer, the gentleman with the stand camera and elastic conceptions of appointments will probably hope for the elimination of the hustler along the lines of convention, as outlined in your article.—Yours faithfully,

LAURENCE H. CADE.

13, Cliffords Inn, Fetter Lane, London, E.C.4

REVERSAL OF FILM NEGATIVES.

To the Editors.

Gentlemen,—In the last number of the "B.J." of August 22, just to hand, there is an article with the above heading, which I have read with much interest, having had a similar experience to the writer of that article. While on a trip some years ago around the Dead Sea by motor-boat a small Kodak was taken along for the purpose of making snapshots of the party. Larger plate cameras were used for taking the views. All plates turned out very successful, but among the films there was an exposure on one of the rolls which has to this day puzzled us. On the east side of the Dead Sea there is a small plain called Ghor et Megraa. Here there is a thermal sulphur spring, with a pool in which the natives bathe, and in order to protect themselves from the direct rays of a tropical sun, an arbour has been built. While some members of the party were indulging in a bath here an exposure was made, due allowance being made for the dense shade. On the roll five exposures turned out good negatives and the sixth one a splendid positive!

The heat of the Jordan Valley, I think, will become proverbial after the prolonged stay there recently of British and Australian troops, and if it is the radiation of heat in and around the camera which penetrates to the sensitive film and produces over-exposure, then anyone who has visited the valley in summer time would declare that the heat there is certainly great enough to turn all films—and why not even all plates?—exposed there into positives!

Further notes, however, on this subject, I think, will be read by many other photographers beside the undersigned.

H. L. LARSSON.

American Colony, Jerusalem, Palestine, Sept. 13, 1919.

THE SALE OF VIEW POSTCARDS.

To the Editors.

Gentlemen,—A few weeks ago you had an article on the sale of picture postcards and advocating pushing the photo-postcard, so that the public would buy photo-cards rather than collotype or other kinds, including the "colour-trosities" (this is not a Geddes new word). The reason the public buy these cards is on account of cheapness, educated in such by the past insane cut prices of pre-war producers of the pictorial postcard. The humble penny is the public's estimate of the value of these things, and I have seen in a well-known stationer's not far from Ludgate Hill twelve postcards of London, sepia-toned, for sixpence, and this some time in 1918. Rank profiteering! Where is the photo-controller and tribunal!

Nowadays the public won't pay 2d. and 3d. which Mr. Philip G. Hunt suggests photographers should charge (2d. to get 50 per cent. profit); but when he suggests 3d. and 125 per cent. profit—Oh! I see his dodge; he wants to get us all locked up for profiteering. Rank traitor to the cause!

Again, if the public want photo-postcards they go to the stationer's as a rule, seldom to a photographer's shop. At least, that was my experience some years ago when things were cheap. I took a good series of photographs of the locality I was in, views and events, yet I had comparatively few sales, although I had a showcase on the wall outside. I sold more in lots to local stationers, so I discontinued it and encouraged the stationers, etc., to take more. It paid better in the long run at that time when a penny was a penny and not a third of a farthing.

I think myself the bulk of the picture postcards are bought by the public, not by the "upper ten" grade of society, and the printed and coloured cards are selected because they serve the purpose and are cheap, and also because the present rate of postage makes it an expensive item to send off, say, six cards at 2d. and postage 1d. each. This is 1s. 6d., and if the cards are 3d. each the cost will be 2s. Holiday-makers are the most prolific users of postcards, and now they have to economise, especially at the seaside. Visitors to a locality buy most of the general views, and no doubt these have the biggest sale.

I enclose a photo-postcard with quotation on back, 37s. per 1,000 semi-matt, black, in 1912. We now pay 100s. per 1,000 for finished cards, a big difference in cost, and so we can't risk having these left on our hands as too expensive to sell. Shops won't buy them on spec. They say they have no great demand for photo-cards, but more for cheaper ones. Photo-card printers buy cards in larger quantities than we can, and get a better discount for cash, yet we can often do cards cheaper by the gross. A better profit is made out of the photographer very often than the photographer can make out of the shops, and therefore the photographer hasn't sufficient inducement to risk unsaleable stock.

Mr. Hunt recommends on one page and advertises on the next, a coincidence no doubt. Still, a photographer knows his locality as a rule, and if he could retail cards would do so. And again, to show photo-view-cards in your window at 2d. and 3d. each beside portrait postcards at, say, 7s. a dozen, would make the public ask why. They don't analyse how it is done, think the photographer is putting on the price, and pass on their way. So it is best to keep the view cards at 2d. and 3d. each out. Explanations are not then needed to show to a customer why you can't do portrait cards cheaper. Your business is then purely a portrait business, so far as the public is concerned, and it is accepted as such. That is my experience of the combination of postcards in 1912 and now.—Yours faithfully,

F. S. WHEELDON.

239, Shernall Street, Walthamstow, E.17.

Answers to Correspondents.

SPECIAL NOTICE.

In accordance with our present practice a smaller space will be allotted to replies to correspondents.

We will answer by post if stamped and addressed envelope is enclosed for reply: 5-cent International Coupon, from readers abroad.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

W. T. W.—We suppose your poster and showcard work would not be offered publicly to anyone, but would be done for individual traders. In that case there is no necessity for you to obtain a licence, which, we suppose, is what you mean. Registration is altogether different, and is necessitated only if you do not trade under your own name.

A. B.—About four 1,000 c.p. half-watt lamps. These should be capable of being raised or lowered between, say, 7 ft. 6 ins. from floor to 5 ft., the latter height being necessary to allow of very short exposures for sitting figures and children. You will find it economical to get a quicker lens, say *f*/4, for very short exposures than to instal more lamps.

H. H. P.—Your room is rather too short for full-length portraits, but will do very well for heads and half-lengths. Half-watt lamps can be obtained from the General Electric Company, 67, Queen Victoria Street, London, E.C. For a great deal of your work the daylight from the window will be sufficient. For full lengths the half-watts might be used as a top light in conjunction with the daylight.

E. B.—We fear you would be able to do nothing with flashlight, as the flash is not quick enough for rapidly moving objects, and even if you succeeded in synchronising a focal-plane shutter with the flash, the plate would probably be under-exposed. The only thing to do would be to employ a large number of arc-lamps, and perhaps, in addition, some mercury-vapour bulbs, as is done in cinema studios.

N. B.—The yellow spots have the appearance of being due to desensitising impurities in the raw base. The methods for avoiding the defects are rather outside our province, but we imagine they will consist in better baryta-coating or in the addition of anti-desensitisers to the emulsion, as dealt with recently in the "B.J." by Mr. W. C. Mann. From the look of the prints under a magnifier the paper seems to have very little baryta-coating.

J. G.—There is no book on studio reconstruction and decoration except the little manual "The Portrait Studio," issued by our publishers, price 10d. post free. As regards electric lighting with half-watt lamps, we had a rather comprehensive article in the

"B.J." of October 26, 1917, which you can still obtain, price 4½d., and the General Electric Company, 67, Queen Victoria Street, London, E.C., have also a gratis booklet dealing with the types of installation which are recommended.

A. N.—For subjects of the kind you describe, by far the best developer is pyro-ammonia, owing to the slightly warm black of the tone and transparency of the shadows. Amidol, owing to its cold black tone, is about the least suitable. Moreover, you will find that there is no developer which will give satisfactory lantern slides unless it is used at a normal temperature. The best advice we can give you is to use the pyro-ammonia formula advised by the maker of the lantern plates. These latter, for the best results, should be of the slow variety.

J. H.—We should say that unless you want to give very short exposures, three 1,000 c.p. lamps will be sufficient for your studio. We should place one about 8 ft. high about 8 ft. from the background, nearly opposite the centre of the latter. Another lamp should be opposite the edge of the background, about 5 ft. away, and the third lamp midway between. These two lamps may be a foot or eighteen inches lower than the front one. If possible, have all lamps made to raise and lower, as this will give more control over the lighting, and allow you to get shorter exposures with sitting figures and children.

O. A.—Any method of putting titles on negatives with opaque calls for neat draughtsmanship and some experience in putting on the lettering reversed, so that it will appear correctly in the prints. The method most usually employed by makers of view postcards is to have the lettering drawn very big or set up in type and photographed down to the requisite size on a press plate. A lot of titles are photographed on one plate, and the film on the negative is then cut through to the glass in strips with a sharp knife and the strips then detached from the glass with hydrofluoric acid and laid on the view negative.

F. T.—The dimensions of studio which you give should be quite large enough for single pieces of furniture, but would not do for suites, for which you would require much greater distance in order to preserve the proper proportions. We assume that you intend to use the studio for portraiture as well as for furniture. We should advise about 15 ft. of glass in top and side light, the latter coming down to 3 ft. from the floor. For the furniture we think a run of glass on the solid side of roof, say 5 or 6 ft., would be very useful so as to equalise the light over a large piece. If the studio were for furniture alone the old "tunnel" form could not be improved upon.

J. R.—(1) In the circumstances you name we do not think a licence is necessary, if it is understood that your advertising and canvassing is in the general Press, and extends generally throughout the country, but is not of a local character. (2) If you open an office so that anyone in your district can walk in and give you orders for work, then we think that you require a licence. Certainly you would if you made a display of your work. The Licensing Order is not very explicit on the particular questions you have raised. It is plainly defined as not applying to businesses carried on with a particular class of traders, and that is what your business particularly corresponds with.

C. R.—You can get a much better result by dulling the metal surface with putty, but it is not the best method. The best method is to arrange a small tent of muslin round the shield, so that objects are prevented from being reflected in it. Then you can strengthen the lighting from one side or another to give any necessary relief to the lettering by bringing any strong artificial light, such as a half-watt or arc-lamp, near to the outside of the tent. You will find this method described in some detail in the little book, "Commercial Photography," which our publishers issue, price 1s. 2d., post free, and which is a handy volume for hints on photographing these miscellaneous subjects.

H. H.—The gas mantle must not be fixed at a given distance from the condenser, because in order to get a clear illumination its distance from the condenser will vary slightly according to the degree of enlargement. You can reduce to some extent the necessity for this movement by inserting a ground-glass screen as near as can be done without risk of fracture to the gas mantle. An opal screen would be better still, but cuts down the light tremendously. The negative, as a rule, should be as close in front of the condenser as you can put it. It is only if the negative is very much smaller than the condenser that there is an advantage in putting it further forward so that you get a more concentrated beam of light on it and thus shorten exposure. Retouching marks on the negative are minimised by diffusion of the light in the way already described, that is, with the ground-glass or opal screen close to the illuminant.

T. L.—The inverted half-watt fitting is a very wasteful one as far as current is concerned, although it gives very soft effects. About four 1,000-c.p. lamps should give you all the light you need if run at full voltage. It seems foolish to handicap yourselves with such a slow lens. We should recommend at least an $f/4.5$ lens, as this with the same light and plate will only require one-third the exposure of one with an aperture of $f/8$. Use thin calico as a diffuser, and have the lamps to raise and lower; the low position will greatly shorten the exposure for children. We should keep the walls light; it is easy to put dark curtains or screens, if needed, to cut off surplus reflection. A useful arrangement of lamps is one opposite centre of background about 8 ft. high, 7 ft. from background, and the other three in a curve from this to the side of the studio, the last one being about 5 ft. from the end wall. These side lamps may be a foot or so lower.

W. G. A.—(1) If the iron is dissolved in the water we do not think it will cause any difficulty, but if it is in the shape of iron or rusty particles you must have the tap fitted with a filter, for which there is nothing better than a bag of flannel tied over it. (2) The persulphate reducer is liable to be erratic if kept long after having once been used. We prefer to make it up fresh for each time of use. (3) With either pyro-ammonia or pyro-soda the best thing for under-exposure is to use the normal formula, but diluted with three or four times its bulk of water. This will avoid your getting such very dense and contrasty negatives, especially with pyro-metol. You will get just as good shadow detail with pyro-soda as with pyro-metol. From what we have seen of your negatives we should advise you to leave pyro-metol alone and stick to pyro-soda, which does not so readily yield the great density and yellowish colour which are characteristic of pyro-metol.

The British Journal of Photography.

Line Advertisements.

Charges for Insertion.

Since advertisements cannot be inserted until fully and correctly prepaid, senders of line announcements are asked to bear in mind the scale of charges. They will thus save themselves delay in the publication of their announcements. A Schedule by which an advertisement can be correctly priced will be sent on request.

Net Prepaid Line Advertisements.

12 words or less	1/-
Extra words	1d. per word.

(No reduction for a series.)

Special Note. Box Number Advertisements.

"Box No." and office address ... ... charged as 6 words.

For forwarding replies add ... 6d. per insertion for each adv't.

If replies are called for this latter charge is not made.

Advertisements cannot be inserted until fully and correctly prepaid.

Orders to repeat an advertisement must be accompanied by the advertisement as previously printed.

Advertisements are not accepted over the telephone or by telegram.

The latest time for receiving small line advertisements is 12 o'clock (noon) on Wednesdays for the current week's issue.

Displayed Adv'ts should reach the Publishers on Monday morning.

The insertion of an Advertisement in any definite issue cannot be guaranteed.

HENRY GREENWOOD & CO., Ltd., Publishers,
24, Wellington Street, Strand, LONDON, W.C. 2.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3103. Vol. LXVI. FRIDAY, OCTOBER 24, 1919. Price Twopence.

Contents.

	Page
Ex-Cathedra	613
Creation and Ownership of Copyright in Photographs	614
Forthcoming Exhibitions	615
The Royal Photographic Society's Exhibition. By F. C. Tilney	616
Practicus in the Studio. By Practicus	617
The Art of Negative Making. By Thermit	619
Some Suggestions on Photographs of Tile Work	620
An Aid to Mounting and Mount Cutting. By Vivian Jobling	622
Photo-Mechanical Notes	622
Patent News	622
Catalogues and Trade Notices	624
Meetings of Societies	624
News and Notes	626
Correspondence— Reversal of Image in Dish Development—Stripping-Plates for Tilles on Negatives—Buying Second-hand Lenses: A Caution	626
Commercial and Legal Intelligence	627
Answers to Correspondents	627

SUMMARY.

The 1920 "Almanac" is now in an advanced state of preparation. Those who have not yet signified their wishes as to advertisement space in it will greatly oblige our publishers if they can do so at the earliest convenient date.

In a contributed article Mr. Vivian Jobling describes a most handy appliance for facilitating the accurate mounting of prints and the trimming of mounts. (P. 622.)

The pictorial section of the Exhibition of the Royal Photographic Society, of which Mr. F. C. Tilney contributes a personal impression, is notable for three or four small but exceedingly choice pieces of work in oil or Bromoil transfer by Mr. Fred Judge. (P. 616.)

In a leading article we deal with the absence of all formalities under the present Copyright Act in the creation of copyright in photographs and other works as a form of property. In proceeding to refer to the circumstances which determine the ownership of copyright thus created, we deal with some of the doubtful cases and point out how, under the present Act, they present a lesser degree of difficulty. (P. 614.)

A contributor, "Thermit," utters a plea for greater perfection in negative-making, and instances items in the making of negatives which seem to him to require emphasis. (P. 619.)

In his article this week "Practicus" deals with the use of flash-light in studio portraiture, pointing out the conditions which require to be observed for successful lighting and advising various practical expedients for dealing with ignition of the powder and the smoke nuisance. (P. 617.)

A host of hints on the taking of photographs to illustrate flooring and wall-covering in tile work are contained in an article on page 620.

A correspondent warns photographers against purchasing from pawnbrokers at the present time R.R. lenses bearing a well-known name unless full opportunity is given of testing the performance of the instruments. (P. 627.)

The Coventry Camera Club has made and handed over to its city's library a collection of photographs illustrative of scenes in the life and writings of George Eliot. (P. 619.)

At the Royal Photographic Society on Tuesday evening last the Rev. A. L. Cortie delivered the twenty-second Traile Taylor memorial lecture, taking as his subject the photographic evidence for the formation of the stars from nebulæ. (P. 625.)

An oil heater for the dark-room, which is efficient and can be improvised from materials ready to hand, is described in a paragraph on p. 613.

Some preparations found effective in the protection of silvered surfaces yet without detriment to their optical quality are mentioned in a paragraph on page 614.

EX CATHEDRA.

The Weekly Almanac. Perhaps even those firms accustomed to getting a goodly proportion of their business through advertisements in the "B.J. Almanac" have not realised the fact that among many photographers in distant parts of the Empire the "Almanac" is always referred to as the "Journal." Why, we do not know; perhaps the second word of the title is seized upon as sufficient. But the fact is significant; it signifies—what every regular advertiser in the "Almanac" knows—that the book is in use throughout the year; that, so far as a business firm in England is concerned, it performs the duty of a weekly circular or journal reaching the hands of a photographer in Tasmania or Trinidad fifty-two times or more during the year. Possibly the persistence of the advertising effect of an announcement in the "Almanac" is not so fully appreciated as it should be by those who have not advertised in it. Yet it is the common experience of firms whose announcements appear in the book and who, moreover, will often get orders for goods which were advertised only in an issue of the "Almanac" three, four, or ten years back. Those who seek for some explanation of this unique and long-continued advertising power need not go far to find it. It consists in the fact that a book of the size and everyday usefulness of the "Almanac" is kept at hand year by year and regularly consulted as a universal "inquire-within-upon-everything" in matters photographic. It is kept not only for the sake of its practical information but for its services as a guide to what is obtainable from British photographic firms. When it is considered that this all-the-year-round service can be bought for as small a sum as a shilling a week, it is not surprising that advertisements in the "Almanac" should run to their great number and should include those of the smallest as well as the largest establishments in the trade.

* * *

Warming the Dark Room. The time of year is fast approaching when most photographers will desire to warm their dark-room in some way. The installation of a gas stove will be found to be a fairly expensive item, and the same may be said of its maintenance. For some years we employed, in a country district where no gas was available, an improvised form of heater that was most economical in use. It consisted simply of a small oil lamp having a wick of about an inch in width, and three flower pots, ranging in size from about ten, twelve, and fourteen inches across the rims. To use the heater proceed as follows:—Light the lamp, trimming the wick carefully, in order to permit of an even smokeless flame. Three blocks of wood are placed in the form of a triangle, the lamp being in the centre. The largest pot is inverted over the

lamp, so that the flame of the lamp is in a direct vertical line with the drainage hole in the pot; the other pots are then put on over the first, according to size, having the smallest at the top. In practice the pots get very hot, and provide a large heating surface. The cold air enters the heater from the bottom, passes over the lamp flame, and out at the top of the upper pot. The heater is practically light proof, leakage of light at the bottom being too small in area to do any harm, while that at the top may be completely stopped when required by putting any form of cap over the hole. Cleanliness in filling and trimming the lamp will entirely avoid smoke and smell, while even when the heater is kept on continuously a gallon of oil a week will be ample.

* * *

Negatives for Enlargement. A great deal of work in the finishing of enlargements would be saved if a little more care were exercised in the production of the negative. A good average negative direct from nature, if enlarged upon suitable paper, will give a result which requires little more than spotting, but unfortunately most enlargements have to be made from copy negatives, and these often leave much to be desired. As a rule such negatives are thin and lacking in contrast, and this we believe to be due to two principal causes: the use of a rapid plate and insufficient development. Under-exposure is another common error in copying, and this is often due to not making allowance for the yellow tint which forms the basis of nearly all old photographs. A clean-looking negative, even if rather thin, will usually give a good enlargement, as any small portions of clear glass in the shadows seem to have more effect on the contrast than they do in contact printing. It is a good plan to use a non-staining developer for negatives for enlargement, as the colour of ¬ro negatives varies, and it is very difficult to allow for this by artificial light. In some cases two negatives will appear identical when viewed by the light of a filament lamp, but when compared in daylight it will be seen that one is much yellower than the other, and needs perhaps three times the exposure.

* * *

Protective Coatings for Mirrors. A note by F. Kollmorgan in a recent issue of the "Journal" of the Optical Society of America reviews our knowledge of the means which can be taken to prevent the tarnishing of surface silvered mirrors without appreciable interference with their optical quality. In the use of a reflex camera the preservation of the silvered surface in an untarnished state is of course a chief factor in maintaining a brilliant image on the focussing screen. It is mentioned that a thin coating of bichromated gelatine is capable of protecting a silvered surface for twenty-four hours from the action of sulphuretted hydrogen. A more usual coating is one of celluloid dissolved in amyl acetate, but, apparently, a preparation which is better in some respects is a commercial lacquer sold in the United States as Lastina. A parabolic reflector at the Harvard Observatory after three months' use under this coating was found to retain 70 per cent. of its original reflecting power. The lacquer is used thinned down with from two to six times its volume of commercial thinner. Apparently, while offering a substantial protection to the silver from atmospheric influences, the lacquer coating itself is very soft and most readily scratched, so that any dust settling on the mirror requires to be most carefully removed by means of a fine camel-hair brush. It would seem that while the lacquer may be a better preparation for astronomical instruments, a very thin coating of celluloid varnish is superior for silvered surfaces, such as the mirrors in reflex cameras, which are more exposed to chance access of dust.

* * *

Marking Time. It is a sad fact that most photographers, at a comparatively early stage in their career, seem to arrive at a dead level in their work, and never produce anything of outstanding merit afterwards. This is to be regretted, for it is not to be imagined that even the cleverest artists could exhaust the possibilities of photography in a few years. Very often we fear that it is due simply to commercialism—that is to say, that the photographer has his eye on the order and not on the picture. We believe that it would be of great benefit to portrait photography as a whole if its professors went in more strongly for exhibiting their work at the annual shows. Nothing is more likely to make a man realise the insipid nature of his ordinary work than to look round for a picture which he can show in competition with others, and if he has the ability nothing will stimulate him more to further effort. To rest upon the fact that customers accept the work offered without complaint or even with approval is not enough, it is only marking time and not progressing from good to better. We hope, therefore, that the next show at the P.P.A. Congress will be a good one, and that it will be well patronised, not only by amateur photographers, but by potential sitters.

CREATION AND OWNERSHIP OF COPYRIGHT IN PHOTOGRAPHS.

It is a somewhat well-worn theme, but as we are still constantly asked by readers of these pages to "make the enclosed photographs copyright," it seems still necessary to set forth plainly the difference between the present Copyright Act and that of 1862, which was repealed, with the exception of one or two sections, on the coming into force of the present Act. Under the old Act copyrights were registered at Stationers' Hall, and most of our correspondents evidently think that the abandonment of this formality renders their ownership of copyright less secure or less definite in some way or other. Such, however, is not the case, although at first sight it may seem so. There is an important difference between the two Acts in this respect, but the difference is not one of greater or less security of title in the copyright in the photograph. Let us explain as plainly as we can in what the difference consists. Under the 1862 Act registration of the copyright at Stationers' Hall was a necessary formality before any action could be taken or any penalty recovered in respect to infringement of the copyright. Under the present Act action for infringement may be taken at any time after the creation of the copyright. This is practically the only difference which the abolition of registration makes to the photographer, and it will be clear at a glance that it is a difference entirely to his advantage. Under the 1862 Act few photographers thought it worth while to register every photograph, copyright in which was their property. Yet omission to do so often precluded them from taking action for infringement. It is this disability which was removed by the present Act.

But we can hear our correspondents replying: "Very well, if that is so, what is there to show that the photograph is copyright or that the copyright belongs to us?" The answer is to read the Act. Section I. of the Act sets forth the general provision that under certain conditions copyright subsists in every original literary, dramatic, musical, and artistic work, photographs being specifically included in artistic works. The conditions are that, in the case of a published work, the work is first published within

the parts of His Majesty's Dominions to which the Act applies. Or, if the work is not published, that the author, when he made the work, was either a British subject or resident within those parts of His Majesty's Dominions to which the Act applies.

There is really no material difference between this provision and that embodied in the 1862 Act, nor did the question of registration make any material difference except in the greater facility already mentioned. Under the present Act, in any action which is taken for infringement, it is presumed that the work is one in which there is copyright, and it is further presumed by the Court that the plaintiff is the owner of the copyright; it is left to the defendant to show that he isn't. The position is therefore scarcely to be distinguished from that under the 1862 Act, because, although photographs could be registered, no inquiry was made by the registration office to ascertain whether the persons registering copyrights there had in fact a legal title to such copyrights. The legality or otherwise of their titles was a question reserved for the Courts. Therefore the difference between the 1862 Act and the present one in this respect consists simply in the presumption that in the general way a person would not register a photograph at Stationers' Hall unless he possessed, or honestly thought he possessed, the copyright in it. Under both the 1862 and the present Act his title to the copyright was and is a matter to be settled by the evidence brought by parties in a legal action.

Now, that ought to be quite clear—viz., that copyright in a work made under one or other of the above-mentioned conditions is an asset or property which can be transferred from one person to another. Section 1., however, does not say anything as to the ownership of copyright thus created. This is done in Section 5, which sets it forth that the author of a work is the first owner of copyright therein. With certain vital reservations, however. Inasmuch as these latter were derived in a large measure from the 1862 Act they are fairly familiar to photographers. It is, we suppose, fairly well realised that copyright in a photograph made by a photographer to the order of somebody else or by a photographer in the regular paid service of somebody else belongs to that somebody else. There is no need therefore to stress the importance which these qualifications have in determining the ownership of copyright; they are, we believe, now universally familiar to photographers. Yet there are, unfortunately, cases which present difficulty in the way of saying whether the photographer actually does or does not come within the scope of one or other of these relations to a "somebody else." That is to say, it is often doubtful if he is carrying out the order of somebody else and being paid for it, and equally whether he is in the paid employment of a somebody else in respect to the making of some particular photographs. It may therefore be of service if we endeavour to throw some light on cases of this character which may crop up.

A case which very commonly leads to dispute is that in which a photographer obtains permission to make a photograph of a group of members of some club or society, very often under some loose verbal arrangement that the club may purchase copies, but without it being specifically defined that the club is ordering the photographer to do the work and is liable for the payment for it. Another kind of case is that of a photographer forming one of an exploration party, but not specifically paid for his photographic services. A dispute may arise as to whether the party as a whole is the owner of the copyrights in photographs taken, or whether these are the sole property of the photographer. Still another instance of this kind is that in which a photographer obtains some kind of privilege for the making of certain photographs which he wants to take —a privilege, for example, such as advance admission to an exhibition. In a case such as this, as also in that of an exploration party, there may be even an arrangement according to which the person granting the privilege or the members of the party as a single body agree to take a proportion of the profits which the photographer makes from his work.

Now, in cases such as these the 1911 Act is fortunately much more definite than that of 1862 in specifying the conditions which require to be fulfilled in determining the ownership of the copyright by the photographer or by a "somebody else." Section 5 of the Act says that the photograph is the photographer's copyright unless it "was ordered by some other person and was made for valuable consideration in pursuance of that order," and, moreover, was made in the absence of any agreement to the contrary. In cases of the kind we have instanced there is usually no order, no person or body who can be sued in a county court in respect to payment for the photographs which the photographer has made; and this latter is a test which can usefully be made in seeking to determine, in the photographer's own mind, whether an order was or was not given. In a case such as that of the member of an exploration party, the terms of his engagement require to show that he is in regular paid service for his photographic work if it is desired to sustain the ownership by the party as a whole of the copyright in photographs which he takes. In the case of a photographer who grants a proportion of his profits in return for some privilege, it is, we think, perfectly clear that the consideration is *from* the photographer *to* the person granting the privilege, and not the other way about, for which reason it follows, of course, that the copyrights in any photographs which the photographer makes belong to him. Those who take the contrary view, namely, that the photographer received a certain valuable consideration in the shape of the privilege granted to him, and that, therefore, the copyright belongs to the person who granted the privilege —those who take this view can base it only on the judgment in the case of Stackemann v. Paton given under the 1862 Act. But, as we have pointed out several times, the incidence of this judgment to cases such as these disappears under the present Act in view of the specific terms of Section 5 to the effect that the work must be both ordered by some other person and made for valuable consideration in pursuance of that order. In Stackemann v. Paton the photographer's work was certainly not "ordered," and moreover Mr. Justice Farwell in his judgment meticulously distinguished between a "good" consideration, which he regarded the photographer as having received, and a "valuable" consideration, which, under the present Act, is the only kind of consideration which the maker of a work must receive in order to deprive him of copyright in it.

FORTHCOMING EXHIBITIONS.

October 13 to November 29.—Royal Photographic Society.—Secretary, J. McIntosh, 35, Russell Square, W.C.1.

November 12 to 15.—Rotherham Photographic Society. Entries close November 3. Hon. Sec., C. Robinson, 26, Broom Grove, Rotherham

November 20 to 22.—Nottingham and Notts. Photographic Society. Entries close November 8. Hon. Sec., A. Beeston, 103, Nottingham Road, Nottingham.

December 20, 1919, to January 24, 1920.—Scottish Photographic Federation. Entries close December 1. Sec.: John Macdonald, 27, Aberfeldy Street, Dennistoun, Glasgow.

THE ROYAL PHOTOGRAPHIC SOCIETY'S EXHIBITION

A PERSONAL IMPRESSION BY F. C. TILNEY.

There cannot be said to be many ways in which the annual display at Russell Square has an advantage over that of the London Salon at Pall Mall. But in one respect the older institution has a boast to itself; for it can point to a sign of development on its own walls which does, in truth, mark a new phase. There are a few oil and Bromoil transfers which, if I may be allowed to say so, reach to a height of style that surpasses what has been done hitherto in any medium of which photography is the basis. They are by Fred Judge.

The Kodak Company having offered to give a demonstration of advancement of photography on artistic lines that these times are blessed with. He has carried printing in colour further than most towards a possible goal. His commercial work, with all its mannerisms and drawbacks, has set a fashion in topographical postcards. But his little set of prints over the mantelpiece of the Meeting Room in Russell Square surpasses all previous efforts, and prove him to be possessed of that rare sense of style which is about the last thing to come to pictorial photographers. These little pictures have a quality that is found in delicate drawings, in mezzo-tints, in steel-engravings, and in lithographs; yet they resemble none of these things. They are, in fact, the achievement of what we have all been hoping and looking for for years. They are photographic and yet they are without the hopelessness which is the skeleton in the cupboard of pictorial photography. It is easy to imagine that prints made in this manner may become individually precious things coveted by the collector.

Much of this value is, of course, the outcome of the taste and skill of their author; and in that respect they have had, and have to-day, their equal in the works of scores of other workers. But it is in the fact of their rendering the customary excellencies of good pictorialism in such an alluring, personal, and amenable medium as Mr. Judge has perfected that their great claim rests. If the Society of Painter-Etchers were to hang "Approaching Storm" (73) or "Kent Oast Houses" (75) in one of its exhibitions, it is certain that either would win high praise in that august assembly of work in the finest traditions of graphic art.

Is this not what our photographic amateurs have been striving for all these years? Demachy, it is true, made a reputation for photography on these lines years ago; but his works have remained all but unique. His mantle fell upon a very few. Mr. Judge wore it first at the Camera Club. It is to be hoped he will wear it at all times and uphold the fashion for it amongst our camera artists.

Mr. Judge's transfers are bright, delicate and rich. They have that fine granulation which the mechanical smoothness of photographic tone makes us regard as a long-awaited liberation. Being clear of photographic material, their high lights are clean—pure paper, in fact, where necessary; whilst their tones, being pigment and not a chemical darkening, are capable of the deepest and richest shade of black where necessary. Add to this that their permanence is that of the indestructibility of the pigment and the paper, then there remains but one possibility for dissatisfaction in them, and that does but lie in the artistic shortcomings possible to all kinds of art expression.

But such shortcomings are few. Perhaps "Sussex" (71) is a little too full of material. It wants quietening, at any rate. The oast-houses in the mid-distance are really subject enough in themselves, and the buildings and incidents on the left of the print might either have been suppressed or eliminated with advantage. The other prints call for no such criticism. "Approaching Storm" (73) is a little masterpiece with the characteristics of a mezzotint. "Kent Oast Houses" (75) reveals what effective extremes of light and shade the process is capable of, without loss of homogeneity. The buildings shining in the sunlight of the middle distance are seen beyond a sort of open shelter in the shadow of the foreground. This arrangement supplies an admirable design exactly in the style of the drawings and etchings of old. "Pastures by the Sea" (77) is much simpler in composition, but its feeling and quality lack nothing. In "Gourock" (79) the smoke from a manufacturing town in the far distance has given a choice theme, of which Mr. Judge has taken skilful advantage. It is obvious from the repeated merits of these prints that they owe nothing to happy chance, but are the actual results of artistic thought and feeling.

Another excellent feature of the exhibition is the work of Bertram Cox, and chiefly his imposing picture of a ruined mill, to which he gives the title, "Four Square to All the Winds that Blow" (105). This is a Bromoil print, worked with due regard to fine pictorial traditions. Its design is admirable, and the treatment of light and shade shows how intensely its author has felt the sentiment of his subject. Mr. Cox's other works are rather discounted by the success of his mill; yet if that were not there, they would be appraised as among the best in the collection. "The Bail, Lincoln, by Night" (59) has a fine and convincingly true effect. The old houses lose their outlines in the night sky, but gleam gently in the faint light of the street. The windows that are lit from within are managed with reticence and loyalty to accurate observation. It is easy to vulgarise such a theme as this, but here all is in perfect keeping. "Gawsworth Common" (84) is an open landscape of excellent composition. Perhaps the sky lacks a full measure of luminosity, but the whole thing is beautifully felt. A somewhat heavy sky is likewise a misfortune in the otherwise satisfactory "Runton Gap" (104), a cliff scene, and the only one of Mr. Cox's set which, by its necessarily high horizon due to an elevated standpoint, bears the characteristics of photographic selection.

It has been my ill-fortune to rail against camera-picture skies for many years; and although progress is slow, yet there does seem to be evidence that photographers are at last waking up to the fact that to put some sort of cloud forms into pictures is not necessarily to achieve a sky. Recent discussion on the matter has elicited a few signs that photographers are beginning to understand that, cloud forms or none, the sky must be luminous. It is better still to meet prints which support the contention. Thos. Bell's "Sussex" (53) is one of these, and it has the further merits of possessing atmosphere. Its effect is very tenderly given upon a composition of simple lines. Good in another direction is the highly dramatic mountain and lake scene by Mr. L. J. Steele, "The Squall" (67). Here the sky is not luminous because it is heavily overcast, but it is well conceived and skilfully presented. J. W. Haynes, however, in "The White Cottage" (101) has a sky of remarkable luminosity, only he has achieved it at the expense of the tones of the other parts which have been a little falsified. The effect of late evening is well and truly given in "Nocturne" (106), by Herbert Felton. He has not done better in his other works. A charming quality distinguishes the "Landscape" (98) of Richard Hopkins, who has managed, in his clean and even tones, to get a painter-like look into the simple and expressive lines of his composition. It is a picture with a perfect mood of a quiet, cloudy day in a stretch of open country. The sky

is beautifully rendered, and its clouds are photographed, not "brought up by hand." This is one of the gems of the show in my view, and proves what is possible in a subject the chief feature of which is its great simplicity of material. There is one more good and expressive sky in "The Storm" (113), by Mr. and Mrs. C. S. Ferguson, with a foaming sea beyond a dark headland.

A remarkably fine design and effect is given by Thos. Bell in his "On the Thames" (64). It is a masterly treatment of an oft-attempted theme of the river and St. Paul's in the distance—a charming mist picture. There are two other works so similar in subject as to form an instructive comparison. One is "Isleworth" (14), by M. O. Dell, and the other, "Dawn—Sun Rising through Mist" (17), by Lionel Wood. The first is a very pictorial effort, its reeds in the foreground and its general composition, together with its misty effect, constituting a most acceptable effort in picture-making. But the sun and its broken reflections in the river do not carry conviction. If they are "faked," the business has been very well done, though not quite well enough. In the case of "Dawn," the composition is scattered, and the pictorial effect spotty; but the sun and its reflections strike one as true. Here, then, is a contrast in methods and results. If one could take Mr. Wood's sun and its reflected image and substitute it for Mr. Dell's hard disc and stripy reflections in "Isleworth" we should have a picture of complete satisfaction. Mr. Dell's "Ranmore Common" (50) also has much in common with C. P. Crowther's "Early Morning, Lincoln's Inn Fields" (52). Both depict the rays of the sun shooting through the leaves of trees; but in this case there is not much to choose between the prints for merit, for each one gives with splendid effect a very fascinating phenomenon.

H. van Wadenoyen, jun., has made a signal success of his "Moonlight" (60), where some old houses are finely and broadly treated in light and shade. The moonlight is quite convincing, and this is in no way due to the green tint of the print. Green for moonlight is a convention of the stage and the cinema. Moonlight has a warm tint in reality, but, of course, a warm-tinted print would lack the suggestive "label," and would look like the ordinary daylight of the average print.

The Bromoils of G. Bellamy Clifton get better and better. His views of Oxford are as good as anything he has yet given us. Perhaps the best is "A By-way in Oxford" (89). Architecture is not plentiful here, but what there is of it is remarkably good. H. E. Wood's "Hallowed Walls" (45) shows a clever treatment of the lines of the steps of a porch of St. Paul's to make an effective design. A street scene of great beauty and interest has been sent by Mr. and Mrs. F. Weston. Its title is "Chinatown" (24). How a picture of such well-rendered planes, so fine a light effect, and such happy design could have been hung on the worst wall of the room is a thing beyond comprehension. "In the Court of Columns" (58) is a purely architectural subject by W. G. Shields. Its light and shade is very pronounced and it looks rich and strong, but it is really too full of matter, and wants the repose of an open space. Herbert Young's "Ruines de St. Césaire le Vieux" (74) is also a fine work.

A few other architectural themes by W. Wilson Smith will commend themselves to the visitor, notably "Backwater at Bruges" (44), where the effect of contrast is excellent.

There are some woodland subjects of good feeling by H. Y. Simmonds, Wm. Rawlings, T. H. B. Scott (and his are strong in mood), Floyd Vail, and others.

It is, of course, ungracious to complain of the poor lighting of these rooms, but it does seem a pity that so much good work should be discounted by being shown at a disadvantage.

F. C. Tilney.

PRACTICUS IN THE STUDIO.

[Previous articles of this series, in which the aim of the writer is to communicate items of a long experience in studio portraiture, have appeared weekly since the beginning of the present year. It is not thought possible to continue the series to the length of that by the same writer which ran through the "British Journal" some years ago, but if any reader among the younger generation of photographers, and particularly those engaged as assistants, has a particular subject which might be dealt with, his or her suggestion will be welcomed. The subjects of the previous articles of the series have been as follows:—

A Talk About Lighting (Jan. 3).
The Camera and the Lens (Jan. 10).
Managing the Sitter (Jan. 17).
Backgrounds (Jan. 24).
Studio Exposures (Jan. 31).
Artificial Lighting (Feb. 7).
Printing Processes for Portraiture (Feb. 14).
Studio Accessories and Furniture (Feb. 21).
The Surroundings of the Studio (Feb. 28).
Studio Heating and Ventilation (March 7).
The Postcard Studio (March 14).
The Printing-Room (March 21).
About the Reception Room (March 28).
Home Portraiture (April 4).
Portable Studios (April 11).
Copying (April 18).
Handling the Studio Camera (April 25).
More About Lenses (May 2).
Enlargements (May 9).
Advertising the Studio (May 16).
Mounts and Mounting (May 23).
Business Methods (May 30).
Photographing Children (June 6).
Portraits of Elderly People (June 13).
Something about Lenses (June 20).
Hand Cameras for Professionals (June 27).
The Dark-Room and Its Fittings (July 4).
Plates and Their Work (July 11).
Apparatus Repairs and Renovations (July 18).
Posing the Head (July 25).
Intensifying Portrait Negatives (Aug. 1).
Workshop Jobs (August 8).
The Personal Factor (Aug. 15).
The Keeping of Negatives (Aug. 22).
Reduction of Negatives and Prints (Aug. 29.)
Leaky Roofs (Sept. 5).
Blinds and Curtains (Sept. 12).
Miniatures (Sept. 19).
Printing Portrait Negatives (Sept. 26).
Wedding Groups (Oct. 3).
Combination Printing (Oct. 10).
Flashlight Work (Oct. 17).

FLASHLIGHT PORTRAITURE.

Having dealt with the character of the flash and the influence of distance and position upon the lighting of the sitter, I will this week go more fully into the details of portraiture by this light. If anything at all approaching ordinary studio lighting is aimed at, the unscreened flash must never be employed; that is to say, a diffusing screen, which may be of paper, calico, tracing cloth, or ground glass, must be interposed between the light and the sitter. Behind the flash

there should be a white reflector, and this may, with advantage, be larger than the diffuser, the light from the uncovered margins helping materially to shorten the exposure.

The position for the lamp must be carefully chosen, and this is not a difficult task for anyone who really understands daylight work. Less experienced operators will do well to experiment with a good oil lamp which can be moved about by an assistant while the operator studies the effect on the face, from a position behind the camera. When the lighting is deemed to be satisfactory, the support for the flash lamp should be placed so that the flash, when fired, should occupy the same position as the lamp, not forgetting that the flash is of much larger area than the lamp flame, and that the centre of the blaze should occupy the same position as the centre of the flame. The room or studio should be lighted as brightly as possible, before and during the time that the flash is being fired, as this not only makes the flash less disturbing to the sitter, but keeps the iris of the eye at its usual diameter. When a person has been sitting in a dimly lighted place, the pupil of the eye increases in size, and this is shown in a flashlight portrait, since the period of exposure is too brief for it to contract to its normal diameter.

For two reasons it is desirable to have the sitter as near to the lamp as may be comfortable to him. One is that, less powder being needed, expense is saved; the other is that the smaller the quantity of powder used, the shorter is the duration of the flash, so that there is less chance of movement either of the eyelids or the head. Another advantage is that there is less smoke. Flash powders vary in their smoke-generating powers, but I have never found one which by any stretch of imagination could be described as "smokeless," which is claimed to be a characteristic of some of the commercial powders. We have, therefore, always the smoke to dispose of. Where only an occasional exposure is made, it may be allowed to disperse naturally by opening windows or doors, as may be necessary. When a number of exposures have to be made in quick succession, the smoke must never be allowed to enter the room, as a very small quantity will destroy the brilliancy of all negatives exposed after the first one. To avoid this, the flash should be fired in a closed chamber with a wide chimney or other outlet communicating with the outer air. A good many years ago I used a very effective lantern, made of sheet iron. The front was composed of a sheet of ground glass, three feet square; the depth from front to back was about eighteen inches, and four simple blow-through lamps were fitted inside. This was hinged to the studio wall, so that it could be swung out at an angle to give a little more frontlight. A small door in the side allowed the lamps to be re-charged with very little trouble. The chimney, which was about six inches in diameter, passed through the studio wall and was covered with a cowl to prevent the access of rain and to obviate a down draught. This arrangement was quite satisfactory, and the portraits could not be distinguished from those taken by electric or even daylight. When using such a fixed lantern it is a good plan to fix three or four incandescent gas lights at the edges of the ground glass. These serve to focus by, and give a very fair idea of the lighting which will result from any alteration of the position of the sitter. A cheaper form of lantern may be made of thin wood thickly coated inside and out with whitewash, the front being made of nainsook, fireproofed with the usual solution of tungstate of soda.

With such lanterns either the explosive flash powders or pure magnesium powder may be used. The former give a quicker and more actinic flash, but they require care in using and should not be trusted in the hands of young or inexperienced assistants, the principal danger being that of premature explosion when used in lamps which require mechanically struck matches, detonators, or the "flint" and wheel. If the trigger is accidentally released while the powder is being placed in the tray, loss of eyesight or, at all events, severe burns may easily result. Having pointed out the risk, it is only fair to say that I have used such powders ever since their introduction without having met with any mishap. A very safe and convenient method of ignition is to place a very small tuft of gun cotton partly under the powder, and to apply a lighted taper to this. The procedure it will be seen is exactly the same as with touch-paper, with the difference that the explosion occurs immediately and not after an interval of several seconds, as with the touch-paper. Electrical ignition has often been recommended, but it is too troublesome for most people, and is not always certain in action. One appliance sold by Boots answers very well. In this a current of 4 volts from a fresh pocket-lamp battery is used to ignite a small fuse somewhat like an ordinary match. The fuses must be fairly fresh and the battery in good order to ensure certainty of firing.

Flash powders are usually sold unmixed—that is to say, the magnesium in one tin or bottle, and the chlorate, nitrate, or whatever the remaining compound may be, in another. Only sufficient for a few days' use should be mixed, as, although the mixture will explode after having been made for several months, its actinic value is greatly decreased when compared with a freshly mixed sample.

Pure magnesium powder is perfectly efficient in action, but makes more smoke and requires a spirit or gas flame to ensure combustion. If burnt in a properly constructed lamp it is quite safe, the only danger being that of sucking back the flame into any closed receptacle holding the powder. Several good lamps are to be had from the dealers, and some of them can be used on groups, one large pneumatic bulb serving to project the powder from several nozzles. I have done very satisfactory work with the pure magnesium, and can strongly recommend it for studio work where a fixed installation is possible. One of the best-known flashlight workers, Mr. Fradelle, would never use explosive mixtures, and his work certainly did not suffer in consequence. Magnesium is very subject to oxidation of the surface, and should always be kept in tightly-corked boxes or tins, as it is difficult to secure perfect combustion unless the powder has a silvery brightness.

The metal may also be burned in the form of ribbon, and this is sometimes useful on outdoor jobs where a flash is objected to. No apparatus is necessary except a box of wax matches and a pair of pincers or even a paper-clip to hold the strands while burning. About a yard of ribbon is necessary to illuminate an office or small workroom, and I have found it convenient to plait four strands together to make a torch nine inches long. The ribbon must be quite bright, or it is liable to go out before the length is consumed, a rub between a folded slip of sand-paper will soon remove any oxide and leave the ribbon in good burning condition. As the burning ash is liable to drop, an old tray or piece of old carpet should be placed to receive it and prevent injury to the floor or carpet. I always make a point of carrying a coil of magnesium ribbon in the camera case when on outdoor work, as it will often enable an otherwise impossible interior to be taken successfully.

Some years ago the Platinotype Company introduced an apparatus for burning the ribbon in a globe filled with oxygen. This system gives a very actinic light, but unfortunately it was rather a clumsy affair, and since the general adoption of electric lighting we have heard little of it. Some of the best portrait work by magnesium which I have ever seen was made by this method.

Although I have spoken only of magnesium, I must not omit to mention that aluminium answers the same purpose, and is, or has been, used in some of the commercial flash powders. Aluminium foil burned in oxygen gives an even more actinic flame than magnesium, but in the pure powder form is rather more difficult of combustion. PRACTICUS.

THE ART OF NEGATIVE MAKING.

Some few weeks ago an advertisement appeared in these pages for a "negative maker." Without asserting that such an advertisement never appeared before or since, as a cover-to-cover reader of photographic literature I have only seen the one, and in a long and chequered career have only met three craftsmen whose work consisted purely and simply of negative making. And yet in the quality of the negative lies the secret of good photography and on the making of it hangs the smooth running of much of the afte-work.

A fellow "pro." once remarked to me that the customer did not see the negatives, and so if the prints were all right nothing further mattered. I pointed out that customers don't usually see beyond the reception-room and studio, but that was no argument for a cramped or leaky dark-room.

Bad negatives are discouraging in their very appearance. They increase the labour of retouching, they use up the printers' time and temper, and they waste paper and developer. And there are more bad negatives made than good ones. I might go further and say that a really good negative—a negative that strikes expert and tyro as decidedly good at a glance—is exceptional.

Now the making of a good, an undeniably good, negative is by no means a difficult process. It requires neither genius nor luck, for before the days of tank development, artificial light, and plates of the high-velocity type, good negatives were common. Anyone who has seen and handled professional negatives of thirty years back will endorse this.

It would seem, therefore, that slow plates, dubious daylight, and cumbersome methods of development are necessary for good results, while tanks, half-watt lamps, and fast plates are responsible for the unreliable negatives that most printers know only too well. Slow plates certainly have advantages that are not universally recognised, and the desire for "speed" is responsible for much poor work, but good negatives can be made on any plates more easily by modern methods than by the laborious means that the old school was dependent on. It is only necessary to give the modern methods a fair chance and not to expect impossibilities to see how much superior they are in every way.

The beautiful negatives of thirty years ago were—many of them—made in spite of the prevailing conditions: they simply had to be good, for any imperfections would be faithfully reproduced in the prints. Just as there were no fast plates or electric light to overcome dark days, so also there were no extreme grades of papers to "cover up" faulty negatives. The advantages possessed by the modern photographer should mean improved negatives, but they offer a clue as to why the improvement is exceptional rather than the rule. Under the old conditions it was imperative to take negative-making seriously. A badly exposed or wrongly developed plate was equivalent to a re-sitting. Negatives that were impossible in appearance were usually considered impossible for printing, hence they were discouraged. With present-day methods the same anxiety is not necessary, but no methods are entirely automatic and a modicum of care is essential with any methods to ensure correct results.

A perfect negative might be described as one of a well lit subject which had been correctly exposed and developed. Lighting is, of course, an artistic function, and as every artist has individual ideas (without which there would be no art) I will pass over lighting with a solitary hint. When the required effect is difficult to get, owing apparently to sheer cussedness on the part of the daylight, it is sometimes useful to photograph a white background—making sure it is white, no mixed tints or uneven patches—with a very short exposure, the lighting being arranged as evenly as possible. Any unsuspected unevenness in the light will show up surprisingly on the negative, and by its aid can be traced and remedied.

Daylight exposures are generally reckoned by the process of mentally "reading" the light, a practice which requires much experience to become expert at. Approximately correct exposures for any time, any weather, can be calculated with the assistance of one of the many exposure reckoners on the market. True, these reckoners do not include a section for studio work, but the exposures advised for "indoor portraiture" divided by some particular factor will be found suitable. The factor can be found by experiment. For instance, suppose 6 seconds is advised at *f*/8 with such and such a plate under such and such conditions, and 2 seconds is found to be correct by experiment in the studio under identical conditions, then all calculations from the reckoner should be divided by 3.

Artificial-light exposures are less variable and can be kept well in hand by the occasional use of an experimental plate. It should be remembered, however, that an exposure that is correct for a full length "sketch" of a lady in white is not sufficient for a black coated bust against a dark ground.

Tank development is a process that makes us wonder what we did without it. The development of a couple of hundred plates is now a vastly different thing from what it was, and the ease with which plates can be put through is no small consideration, particularly when no risk of bad results is entailed. If the important details of tank work are neglected, however, there is a big risk.

The details I refer to are accurate compounding of the developer, thorough mixing and careful dilution, time, and, last but certainly not least, temperature. To take them in the reverse order, temperature is more likely to trip up a careless worker than anything else. I remember once asking an operator why he did not use a thermometer. He replied that the hot water he used to dissolve his sulphite "just brought the tank up to the mark." This occurred on a frosty night. The following August he was still proceeding on the same lines, oblivious to the fact that "the mark" had risen some thirty odd degrees.

A slight mistake in time is not so serious, but it is very little trouble to keep both time and temperature exact.

Developing formulæ and dilution are matters of individual choice; any developer at any strength in reason will produce fine negatives if used deliberately and with intelligence.

Negative making is considered by some as ended with the fixing. Others include reduction and intensification, while others bring in retouching and other artistic or mechanical treatment. To go into them all would be too lengthy, but a passing word on each will not be out of place.

Reduction of harsh negatives is often carried out with Farmer's formula when the correct thing would be persulphate. The reason for this is probably that persulphate needs a little coaxing; sometimes it seems to hang back, sometimes it needs acidulating. Intensification still goes on with mercury-ammonia in spite of all that has been said and written on the advantages of bichromate. For those who haven't bichromate handy, mercuric iodide is far superior to the chloride and much simpler and safer. It consists of one solution only, it does not demand careful washing out of hypo, it seldom stains, and, besides being a useful intensifier, it will also detect improper fixation by whitening any invisible silver thiosulphate which can then be fixed out by re-immersion in hypo.

Leaving retouching alone as far as these remarks are concerned, I would still like to point out that where an aerograph is handy it can be turned to distinct advantage on certain negatives. Copy negatives can be vignetted and sketchy backgrounds strengthened with an aerograph in as many seconds as it would take minutes by any other means. For this work red dye is preferable to paint, though it has the disadvantage that it will not rub off if required.

Thermit.

Photographs of George Eliot Country.—At a special meeting last week at the premises of the Coventry Photographic Club the collection of photographs illustrating scenes in the life and writings of George Eliot were formally handed over to Mr. E. A. Savage, librarian of the Coventry City Library. The photographs number from sixty to seventy, and had been prepared as a contribution in connection with the recent celebrations of the centenary of George Eliot. Mr. Savage, in acknowledging the donation from the Coventry Camera Club, said that it should be a matter for congratulation that Coventry now possesses the finest and most complete photographic record of George Eliot in this country. The photographs are to be displayed as a public exhibition during November.

SOME SUGGESTIONS ON PHOTOGRAPHS OF TILE WORK.

[We are glad of the opportunity of reprinting through our contemporary, "American Photography," the following notes which form a booklet issued by the Associated Tile Manufacturers of the United States specially in reference to the conditions which require to be observed in making commercially valuable photographs of rooms and places for the floors and walls of which tiles are used. It would seem that the notes have been drawn up for the information of individual tile manufacturers. At any rate, they exhibit such an informed sense of what is required in photographs, not only of these subjects, but of commercial subjects in general, that they deserve the widest publicity which can be given to them among photographers.—EDS., "B. J."]

I.

THE value of a photograph as an instrument of tile promotion work rests with three salient necessaries. First, and above all, the photograph should show a good tile job, something readily recognised. Secondly, it should have artistic, that is to say, pictorial qualities. Thirdly, it should possess that degree of technical excellence, finish, tone, etc., which distinguishes the serious work of expert photographers and specialists from the nondescript perpetrations of the dilettante.

The first requirement has proved a reef on which many a boat has been wrecked, for the most thoroughly trained and high-priced photographer cannot efface the setter's and designer's sins. Few serious attempts have been observed that wholly satisfy the second requirement, and only in rare cases have discrimination and care been exercised to make certain of the third.

We shall therefore pass in review those essential factors which tend to bring about or enter into the production of good photographs without, however, venturing into a boundless jungle of unnecessary detail.

Always we must hold in mind that to us any photograph is a means to an end; its sole object is to set forth effectively and convincingly the practical worth and artistic merit of tile. Every effort should be put forth, every device employed, and every principle of good taste applied to depict tile and tile work to the most telling advantage.

Considering the undeniable value of pictures as sales mediums and the lasting impression they leave on the mind, the production of photographs of tile work should not be left to luck or chance. A range of important requisites must be fulfilled, else the result will defeat all efforts to interest, enthuse, and convince a prospective user of tile.

A mere picture cannot fill the bill. A poor photograph is worse than none. Only by careful selection of subject, good photography, and premeditation of effects can a picture of lasting value as a sales medium be evolved.

All of our photographs must cater to the inherent love of mankind for the beautiful, no matter how practical a subject they depict. Along the lines of this fundamental human trait our appeal can be made with least resistance. The charm of a beautiful picture arouses the esthetic sense and excites an impulsive desire for possession. In this way the picture of an exquisite kitchen or bathroom causes admiration—a sort of pleasure—that tends to create a want, an ostensible need, for a similarly attractive kitchen or bathroom. The tile contractor eventually participates in that pleasure.

The initial step is the selection of the proper kind of a job. Jobs of appeal and in harmony with the sentiments of everybody constitute the most desirable subjects. Consider the sentiments of people in general and avoid as much as possible tile work installed in close proximity to waterclosets, urinals, and similar places. To picture such spots with delicacy requires unusual skill, and had better not be attempted.

Naturally, the next step to consider is the workmanship of the job to be photographed. Workmanship is a complex topic when it comes to tile work, and to define its consummate meaning shall not be attempted here. The tile contractor himself, better than anyone else, knows the axioms of good workmanship. While there are any number of intermediate degrees of excellence, it should not be difficult to distinguish between an actually good job and a poor one. However, pay especial attention to careful lay-out and fitting of tiles into given spaces, to uniformity, neatness, and geometrical accuracy. Avoid jobs sprinkled with "dutchmen." Incorrect use of trim shapes is also a defect.

The design is one of the first things we notice in a photograph. Let this first impression be pleasing.

By design is meant that part of the tile work which deals with deliberate planning and arrangement. It has to do with the execution of an idea, an inspiration, that arises out of the conditions peculiar to each job.

Appropriateness, utility, and delight are the ultimate objects of design. Good design is therefore a relative term, but no tile job can be called "good" unless the design also deserves the attribute "good."

A design can be original, elaborate, decorative, stunning, striking or symbolic without being artistic—without being tasteful, beautiful, pleasing, and fitting. In spite of the former characteristics, it may be crude, commonplace, irritating, or unsuited. There can be too much or too little too large or too small, too light or too heavy design.

There is no basis for the current presumption that a design must of necessity be in colours. Any white wall, for instance, may be the object of good design, and pleasing effects produced in monochrome by variety and rhythm in size, shape, and direction of units in combination with the joints make excellent photographs.

In all cases it becomes a matter of good taste and judgment to decide between desirable and unsuitable jobs for our purpose.

After a number of jobs have been selected arises the problem of finding a capable photographer. A man who has had experience in architectural or commercial work should be secured, an expert with wider knowledge than that of mere mechanism and chemical details; he should be able to submit satisfactory samples. There is more in real photography than just pressing the bulb. As there exists a vast difference between tile contractors and tile contractors, so is there an equally deep gap between photographers. The mere fact that a photographer charges a high price for his work is no indication of great ability nor value in his work.

A few "Don'ts" may not be out of place in this connection:—

1. Don't try to take pictures of tile work yourself.
2. Don't think any portrait photographer can do it.
3. Don't give the work to the lowest-priced man on account of cheapness; it is poor economy.
4. Don't leave everything to the judgment of the photographer.

No matter how "good" a photographer is engaged, it is advisable to go over the ground with him, give him instructions in regard to the part to be photographed, point out any important or peculiar features, things that should be brought out or those to be omitted or subdued. It will help him considerably to know what the essentials and peculiarities of tile work are. Also, a few pencil strokes will often indicate to him what is wanted much better and quicker than the most careful verbal instructions. A good photographer and a good tile man make an excellent team.

Much depends on the selection of an advantageous view-point, or, in other words, where to set up the camera. The more care the photographer exercises in determining this point, the more surely can a satisfactory result be expected.

Assuming for the time that the entire room is tiled uniformly, the location of this point is influenced by various factors: location of the windows or other sources of illumination and the resulting distribution of light and shade; extent of the subject to be photographed as to width and height; the lens of the camera; by the foreground and middle distance; the equipment or furnishings, the nature of the design, and similar conditions.

Photography is impossible without light. Yet, in the photograph, shade is as necessary as light. But shade should never be so impenetrable nor light so bright that details are lost entirely. The illumination must be of such character "that the parts represented in shadow shall still have the clearness and warmth of those in light, and those in light the depth and softness of those in shadow."

This can be controlled to a greater extent than seems possible at first thought. In most cases the desired illumination may be obtained by watching and waiting till the best natural lighting conditions occur. Watch for that time of day when the particular portion of the tile work to be photographed is illuminated to the best advantage, which may be in the early morning, at noon, or late in the afternoon.

On the other hand, some subjects never receive adequate or suitable illumination naturally, and in such cases artificial light must be resorted to.

Sunlight—of all sources of light—is the strongest, not only in regard to brightness, but also in respect to chemical action on the sensitised photographic plate; and, by the way, it is the cheapest. Keep in mind that detail is lost in extremely bright light and very dark shade; that the brighter the source of light, the stronger the contrast between light and dark portions of the pictures and the sharper the edges of shadows Excessive intensity can be reduced by putting white or light blue tissue paper over all or some of the windows, over the entire opening or portions of it, just as may be required to produce a specific lighting effect.

Much improvement can often be made by equalisation, especially in the upper and generally darker portions of walls, by shutting out some of the light entering through the lower panes. This will also serve to make the lighting of floors more uniform. Ordinary window blinds are usually too opaque and shut out too much light, and when drawn down over the upper panes are apt to throw the ceiling and higher portions of walls into impenetrable darkness.

White tile work looks pleasing and natural only when the photograph shows it white, not grey. Its lightest portion should be selected as subject for the picture, not the darkest. Owing to greater contrast, white tiles in a strong, bright light give snappier pictures than in diffused light, provided care is taken that reflections do not occur in the principal sections of the work.

With tile work in colours the opposite is true, and this class of work demands a soft diffused light, or the fine gradations of tone are destroyed. But even in such cases a uniformly lighted surface, without any shade whatever, is not desirable. It always looks flat and monotonous because, as has already been said, shade is as important as light in producing a pleasing picture; deep shade, however, should not occur in the main portions of the tile work or where it will detract. At least part of the tile work should receive full light, for parts in full light are usually the ones to attract the eye.

Very light subjects can be photographed also by double exposure—that is, by first exposing for one second or less in bright sunlight and using diffused light during the remainder of the necessary time of exposure.

Generally speaking, light should not come from two opposite directions, since this does away with all shade and gives a "flat" picture. In rooms having windows on opposite sides the light from one set of windows may be shut off sufficiently to allow the other set to cast some shadow. Do not shut off all the light, but use tissue paper or similar material as described above.

A certain amount of reflection is desirable, especially in white glazed work, but spotty effects should be avoided.

Flashlight rarely produces satisfactory photographs of tile work. Its manipulation is so difficult and the result so uncertain that one can never tell with any degree of certainty how the picture is going to look, because the image on the ground glass or focussing screen is observed under entirely different lighting conditions than those occurring during the flash, unless while focussing strong electric lights (without shade or reflector) are placed in exactly the same position where the flash or flashes will be fired.

The broad lights and shadows of flashlight illumination are characteristic of an unnatural absence of detail, and are always devoid of enjoyable gradations. At best, flashlight produces ghastly effects, glary whites, impenetrable shadows, and extensive reflections. The practical deduction is this—flashlight should be used only when no other more satisfactory means of lighting can be employed. Yet a flashlight is better than no light at all.

Never fire the flash directly behind the camera when the wall is parallel to the picture plane. It will surely result in extensive and glaring reflection and increase the possibility of "fogging" the plate. To avoid danger of fire and to retain the smoke, flashlight should be fired in fireproof bags manufactured for this purpose.

Commercial photographers have perfected various methods of artificial lighting. In one of them an electric searchlight with reflector of the order of automobile headlights is employed. The rays of light are directed over either the entire subject or dark portions during exposure. Whole rooms can thus be photographed with excellent results without the aid of any other source of light. In fact, some of the best pictures of interiors have been produced in this way, and show astonishing definition of detail. Store windows and arcades can be photographed at night in this manner. But it is also used and recommended in combination with daylight for lightening up dark portions and deep shadows. The time of exposure must then be lengthened by "stopping down" the diaphragm opening. Such apparatus must, naturally, be manipulated by a man who is familiar with its effect. Good results can be expected only where the light is moved over the subject with uniformity and in various directions—up and down, sideways and diagonally—otherwise the finished picture will show streaks and spots.

When the subject is small—as a fireplace, for instance—dark sections or corners may also be lightened up by hanging or holding sheets of paper or cloth facing such portions.

Any good photographer knows all these tricks, and they are mentioned here solely to show that a number of means and ways are available to overcome obstacles, and that lack of adequate or suitable light is no reason for giving up as hopeless the photographing of an otherwise desirable tile subject.

Anything as shining and glistening as glazed tile should convey to the mind this desirable mirror-like smoothness, polish, and brilliancy in its photographic reproductions. It cannot appear so, however, without reflections. Concrete and stone walls have no high-lights and reflections, and the mind thereby recognises their texture and identifies them. In photographs of tile work we must have high-lights and reflections or lose the key to their identification. These practical considerations are expressed for the benefit of those who anxiously strive to eliminate every trace of solar tinsel and find no rest till the last speck of warmth and joy and play of light is eradicated, with the result that tile finally looks as dead and barren as a cellar floor.

True, reflections can destroy or mar pleasing effects and can be overdone like any good thing, but as a rule such conditions can be remedied by correcting the disturbing light-effect or faulty lighting.

By faulty lighting we have reference to instances where the rays of light do not strike the tile at a proper angle. This defect can be remedied by one or a combination of "tricks of the trade." (See section on light.) Without question, some way can always be found that retains a vital amount of light for exposure and the high-lights on the tile, but at the same time eliminates extensive and disturbing reflections.

Halation is a common fault of pictures that include windows, burning lights, etc., and can seriously mar a picture. An excess of light streaming into a room through windows or radiated by powerful electric lights on the tile—especially white tile—often results in a glare and myriad of tiny reflections in different directions, and either much of the detail is obliterated or adjacent areas are reproduced much lighter than the rest. This defect can be avoided by the use of non-halation plates. Insist upon your photographer using them for all your work. Films are free from this shortcoming.

(To be concluded.)

The Catford, Forest Hill, and Sydenham Photographic Society has commenced its winter session, meeting at the Dartmouth Hall, Forest Hill, every first and third Monday. A good list of lectures and other fixtures has been arranged. Anyone in the district interested in photography is invited to write to the Hon. Secretary, M. Hovenden, 18, Princethorpe Road, Sydenham, for syllabus and conditions of membership.

Horseback Portraits in Hyde Park.—According to the "Daily Mail," the Office of Works is inviting photographers to tender for the exclusive right of taking portrait photographs of persons on horseback in Hyde Park. It is stated that the period of the licence is for one year from November 1, 1919, and that the position of the operator is confined to the west end of Rotten Row on the south side, and subject to the approval of the police. Particulars and forms of tender are obtainable from the bailiff of the parks, Major W. E. C. Hussey, R.E., Office of Works, Storey's Gate, S.W.1.

AN AID TO MOUNTING AND MOUNT CUTTING.

When mounting prints, particularly those of large size where an ample margin of mount is required, it is very desirable that the side margins should be of exactly equal width. However, when a number of prints are being dealt with, the additional trouble of measuring first one side and then the other, then adjusting and measuring again, often leads to the mere guessing of the central position, with a resulting inaccuracy which may offend a more trained eye than that of the worker.

The use of a simple bisecting rule of the type illustrated and described below quite overcomes the measuring difficulty, and will be found of great assistance in rapidly centring a print on its mount.

It will be found of even greater assistance when it is desired to trim the mount of an already mounted print to fit a stock size frame, or for marking off the openings when making cut-out mounts.

The rule may be of the ordinary two-foot type, such as probably already used by the reader, but with the figuring altered so that the centre is zero and each half-inch on either side is marked as an inch in ascending order to twenty-four. The smaller divisions of quarters, eighths, and sixteenths are, of course, read as halves, quarters, and eighths with the new marking.

It will be readily understood that such a rule can be quickly placed upon a mount so that the reading is the same at both edges, after which the print can be centred on the mount in a similar manner with equal facility. From the position of the rule, as shown in fig. 1, it will be seen that the figures at the margins giving

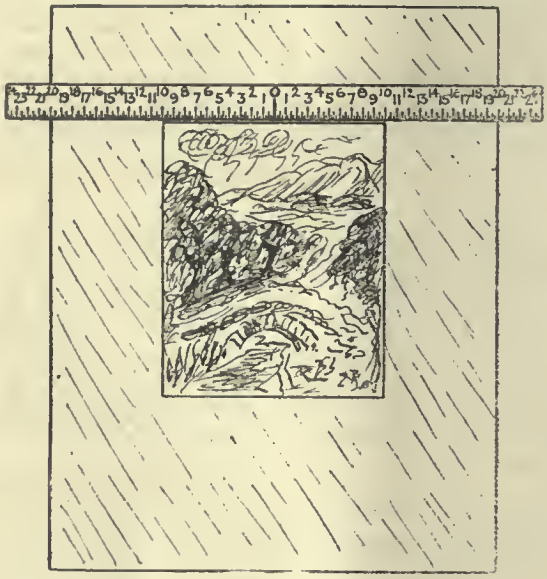


Fig. 1.

the actual widths of print and mount respectively, any desired width of mount can be marked off when the rule is centred on the print, or any desired width of opening or space for print or tint, when the rule is centred on the mount.

There are also many other purposes in ordinary workshop or workroom practice to which this ready means of bisecting may be applied, such as marking off wood, cutting up mounting boards, spacing screw holes or halving rolls of paper.

In the re-marking of the rule the gumming of a strip of paper over the existing figures and the writing of new ones thereon is

Fig. 2.

all that is really necessary, although the method adopted by the writer will be found more effective and lasting. In this case the upper half of the rule was painted out with black varnish and, when this was quite dry, the new figures were printed in with aluminium paint, using an ordinary pen. The use of aluminium paint in this way will be found much simpler than might be expected, and will also be found very useful for printing numbers on the backs of dark slides or titles on the covers of books. The smaller sketch (fig. 2) shows a portion of the rule when finished as above described.

Vivian Jobling.

Photo-Mechanical Notes.

Detail in Coarse-screen Work.

The coarser the screen the greater the loss of detail in any reproduction, and yet very often the illustration is almost useless unless the detail is preserved. While the engraver cannot do the impossible and give detail with a coarse screen, yet it is possible with particular originals by means of a "stunt" to give the customer just what he wants. Such an original is one in which the detail is a small part of it and surrounded by work in which the detail rendering is not so important. In this case two negatives are made, one of the whole original on the coarse screen and the other of the small part showing the detail on a much finer screen. Then this part is stripped away from the coarse-screen negative, and the fine-screen negative of just that part stripped in. The engraving will print well because the fine part is supported by the surrounding coarse-screen work, but obviously the method is only suitable for special subjects.

Vignetted Half-Tones.

There is no doubt that the letterpress printer has most difficulty in printing satisfactorily half-tones with vignetted edges, and that very often the responsibility for a poor result rests upon the engraver, because he makes a vignette with edges that are too shallow. This comes about from the practice of re-etching by scrubbing the edges with a stiff brush and perchloride, which, of course, rapidly reduces the size of the dot without giving the plate corresponding depth. The best way is to paint out the plate and paint an outline beyond the vignette, and then return it to the etching bath and allow it to etch until the dot is fine as possible, which will give also the maximum depth. Or if this is considered too much trouble, and the re-etching is done on the bench, then apply the iron etch and allow it to rest on the plate without brushing, occasionally mopping it up and applying fresh etch. If a vignette that is too shallow is sent to the printer, he cannot be blamed for butchering it with a lining tool or smashing down the edges with a hammer, both of which practices are anathema to the lover of fine printing and engraving.

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Applications, September 29 to October 11:—

Printing.—No. 23,910. Photographic printing. F. W. Donisthorpe.

Projection Screens.—No. 24,226. Manufacture of screens for cinematographs, etc. W. Bemrose and J. W. Verity.

Cinematography.—No. 23,861. Combined reel for winding and unwinding cinematograph films on same spindle. S. England and W. Thomas.

Cinematography.—No. 23,857. Motion picture machines. F. McMillan.

Cinematography.—No. 24,068. Automatic fire-extinguisher and stop motion for cinematographs. W. Taylor.

Colour Photography.—No. 24,336. Photographic camera for taking part-negatives for pictures in natural colours. S. de Proudine-Gorsky.

Printing Machine.—No. 24,780. Electric photographic printing or copying machines. J. B. and J. Halden and Co.

Stereoscope.—No. 24,660. Folding stereoscope. J. M. Hattersley.

Mounts.—No. 24,756. Photo mount. G. H. Landergan.

Frames.—No. 24,444. Photographic frames. A. E. Phillips.

Frames.—No. 24,445. Photographic frames. N. Phillips.

Printing Apparatus.—No. 24,598. Apparatus for photographic and mechanical, etc., printing. E. W. Spears.

COMPLETE SPECIFICATIONS ACCEPTED.

These specifications are obtainable, price 6d. each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

ENVELOPES FOR FILMS AND PLATES.—No. 120,572 (August 29, 1917). The invention relates to envelopes for photographic films and plates in which a sliding shutter is withdrawn for an exposure of the sensitive surface after the envelope is placed in a camera. In one such arrangement the film or plate is inserted into a bag-like sheath, which is then slid into a frame of stout paper or cardboard having a back with side and bottom edges bent over, the bottom one being bent over the side edges and adapted to engage a pro-

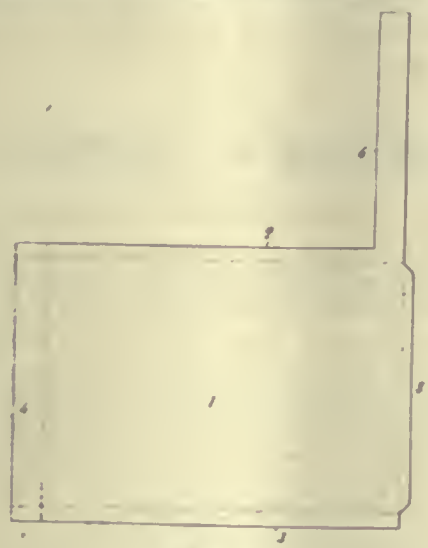


Fig. 1.

jecting tongue in the bottom of the camera to retain the frame in position.

The main object of the invention is to combine the special advantage of the well-known roll-film cartridge—viz., the ability of inserting the film by daylight in the developing apparatus, with the advantage which the also well-known form of packing "film-

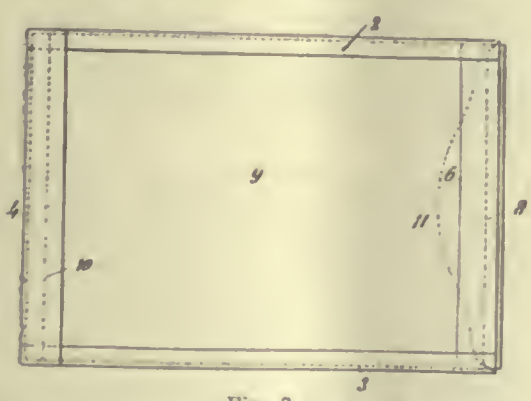


Fig. 2.

packs" presents over the roll-film—viz., to allow the use of ground-glass in the camera, and in addition to combine these with the advantages which every single enveloping of films known up to now present over the two aforesaid—viz., that ordinary or orthochromatic films may be used at pleasure, that the plates or films in their envelopes may be sold singly and are easier transportable, and that development may be undertaken at any time without it being necessary to await the exposing of other films or to make unnecessary exposures on these only in order to be able to commence the developing, and, finally, that the films may at pleasure be developed singly (as with film-packs, but in contrast to roll-films). Further, the invention aims at avoiding the use of an adapter (a special holder or small case for the envelope), which is as a rule used with film-packs and most of the film envelopes. The envelopes are especially intended to be placed in cameras with a hinged back frame and with a spring-mounted ground-glass frame.

The envelope consists of a back, 1, of opaque thick paper, the form and size of which will as a rule depend on the size of films, with a holding strip, 6, and a cover or shutter, 9; the two long edges, 2 and 3, of the back are bent over, and the one short edge, 4, is then bent over upon the bent edges, 2 and 3 (these bent-over portions may be fastened to each other), so that a somewhat project-

Fig. 3.

ing resilient edge, 5, is formed, and along the opposite short edge of the back plate, 1, the two edges, 2 and 3, are connected by the pasted strip, 6. Hereby an envelope is formed to receive the film-sheet, 7, which is kept in its place by the bendings, 2, 3 and 4, the strip, 6, and a bending, 8, of the remaining short edge of the back, whith edge is bent under strip, 6.

Between the film, 7, and the three bendings, 2, 3 and 4, and the strip, 6, the cover or shutter, 9, may be inserted. This consists of a piece of thick paper of nearly the same breadth as the film, its one short edge having a bending, 10, which, when the cover or shutter is drawn out, will co-operate with the opposite bend, 8, on the back, and prevent the shutter from being completely drawn out. Such a shutter will ensure freedom from light-leakage during exposure

The opposite short end of the cover or shutter has a hasp or tongue, 11, which, when the shutter is pushed down and has

Fig. 4.

covered the film, may be bent down over the rear of the back, in order to attain light-tightness, and be sealed, besides serving as a fingerhold during the withdrawing of the shutter.

When an exposure is to be made, and the lens is adjusted, the closed film-envelope is inserted into the camera. The camera may, for instance, be constructed with a hinged back-frame and the ground-glass may be yieldingly mounted therein, so that the envelope may be introduced after the back frame has been opened.

Alternatively, the camera may be constructed so that the envelope may be inserted in front of the ground-glass, while this is

Fig. 5.

pressed back. After insertion of the envelope the seal is broken, the back frame is closed if it is hinged, and the shutter, 9, is drawn up and uncovers the film, which may now be exposed. In both cases the edge, 5, will co-operate in the closed back frame of the camera with a corresponding edge, which thereby keeps the envelope fast during the drawing up of the cover plate, so that the usual manipulations for this purpose are avoided.

When the exposure has been finished the shutter is pushed back, being of stiff paper so that the exposed film is covered light-tight, and the envelope is then taken out of the camera, by causing the back frame to be opened, so that the edge, 5, is free of the corresponding edge in the camera. The envelope may then be sealed again, but in a manner which differs from the former sealing, such as by a fresh seal or by an unused portion of the gummed tongue, 11.

The bendings, 2 and 3, form a guide for the shutter during its

displacement, and owing to the bending, 4, being placed above the bendings, 2 and 3, the bending, 4, springs itself—together with the edge, 5—somewhat away from the back plate, 1, by which (when the camera is constructed in such a manner that the bending, 4, has sufficient room in it) it results that the bending, 10, slides easily in under the bending, 4, without meeting resistance, when the shutter is pushed back after the exposure is finished. The sliding of the shutter is assisted by the increased stiffness thereof obtained by the bending, 10, which serves also the task of removing, before the exposure, fluff and dust from the surface of the film, as it slides on over this when the cover or shutter is drawn up.

The hasp or tongue, 11, serves, besides for the purposes mentioned, by its tongued form, also to introduce the envelope into a developing apparatus such as described in Patent No. 119,246 ("B.J.," September 26, 1919, p. 566), and the strip, 6, serves partly as a guide for the shutter, 9, during its displacement for covering and uncovering the film, 7, partly it contributes to secure that the shutter—when the envelope is manipulated outside the camera with broken seal—shall remain in its place, protecting the film from the light, and finally it ensures by means of its thickness and by the thickenings produced on the bendings, 2 and 3, by the pasting—that the envelope remains in its place in such a developing apparatus when the shutter is drawn out in order to uncover the film for the developer.

The envelope here described may also be used for glass plates, 13, in which case two small strips, 12 (figs. 4 and 5), are then laid into the envelope along two opposite sides of it in order to keep the glass plate in its place relatively to the light-opening, as the glass plate, 13, must always be somewhat smaller than the size of the film, intended for the same picture size.

It is obvious that it is not necessary to insert and withdraw the shutter longitudinally of the envelope, but the construction may be such that the long dimension of the envelope forms the sides. Likewise the film, of course, need not fill out the whole space in the envelope, but may be smaller and surrounded by a frame which fits within the said bendings, and moreover, the invention may be varied in different ways without the principle of the invention being departed from.—Jens Peter Hansen, 10, Jacoby's Allé, Copenhagen.

Trade Names and Marks.

APPLICATIONS FOR REGISTRATION.

CRISTALITE.—No. 391,510. Chemical photographic developers. Karl Malmberg, 110, Cannon Street, London, E.C.4, merchant. May 22, 1919.

LACTOID.—No. 394,292. A material manufactured from animal substances, sold in sheets, rods, and tubes, and goods manufactured therefrom. British Xylonite Company, Limited, Hale End, Chingford, London, E.4, manufacturers. August 15, 1919.

CATALOGUES AND TRADE NOTICES.

THORNTON-PICKARD ENLARGERS.—The Thornton-Pickard Company, Altrincham, have just issued a booklet describing the various models of their enlargers now obtainable. These range from the "Artist" enlarger, of comparatively simple pattern, to the "Professional" model, made only in whole-plate size, and embodying the best features of the other designs. Among these latter is the "M.C.C." No. 6, the enlarger adopted as a standard instrument by the Royal Air Force. The booklet, which contains particulars also of semi-automatic arc lamps for use in enlarging, is obtainable free on application.

ALBUMS AND MOUNTS.—Messrs. W. Butcher and Sons, Camera House, Farringdon Avenue, E.C.4, send us a 32-page illustrated list of the many patterns of album for prints made and sold by themselves. A large proportion of these are of the slip-in pattern, but the list specifies also a number of designs of album in which prints are mounted in the ordinary way. The popular "Sunny Memories" series is obtainable in a considerable variety of styles and sizes, and the list also gives details of the very convenient ready-made passe-partout frames for prints of comparatively small size, which are specialties of Messrs. Butcher. The illustrations in the list fail to do justice to the very artistic appearance of these passe-partouts.

X-RAY EQUIPMENT.—Radiography is now of the highest importance, not merely in the diagnosis of disease for the purposes of the physician or surgeon, but in the investigation of industrial materials and products for flaws and defects which could be discovered so easily in no other way. A price-list commensurate with its subject has just been compiled and issued by Messrs. Watson and Sons (Electro-Medical), Limited, Sunic House, Parker Street, Kingsway, London, W.C.2. It is a book of 370 pages, and specifies most fully the items of equipment and the numerous accessories and materials employed in X-ray work. A large proportion of these are manufactured by Messrs. Watson in their own workshops, but their list includes the many pieces of apparatus which owe their existence and development to experimenters in this field, the boundaries of which have been extended in many directions as the result of the great demand for X-ray investigation during the war. There can be no question that the catalogue is the most complete and up-to-date of any which those employing X-rays or interested in radio-therapeutic methods can possess. It is a large and costly book, and is supplied at the price of 7s. 6d.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

MONDAY, OCTOBER 27.

South London Photographic Society. "Sylvan Essex." J. McIntosh.
Dewsbury Photographic Society. "Bromoil Printing." W. E. Gundill.
Willesden Photographic Society. Affiliation, "One Man" Portfolio." L. J. Steele.
Bradford Photographic Society. "Lantern Slide Making." C. E. Lawson.

TUESDAY, OCTOBER 28.

Royal Photographic Society. "The King's Highway." A. H. Blake, M.A.
Hackney Photographic Society. "Transferotype and its Uses." F. W. Slater.
Chelsea Photographic Society. Affiliation Portfolio, with criticism.
Manchester Amateur Photographic Society. "Gems of English Architecture." T. Burton.
Birmingham Photographic Society. "Photographic Technique Simplified: A Few Photographic Problems Developed and Fixed." E. A. Biermann.

WEDNESDAY, OCTOBER 29.

Croydon Camera Club. "Colour." F. C. Reynolds.
North Middlesex Photographic Society. Night Outing.
Dennistoun Amateur Photographic Association. "Facts About Development." W. W. Mollison.
Partick Camera Club. "Apparatus and Exposure." A. T. Edgeley.
South Suburban Photographic Society. "Picture Making in Northern Italy." G. H. Dannatt.
Royal Photographic Society. "The Late German South Sea Possessions." T. J. McMahon.

THURSDAY, OCTOBER 30.

Liverpool Amateur Photographic Association. "Aerial Photography." Lieut. Fyffe.
Rodley and District Photographic Society. Monthly Competion. "Haivesting."
Hammersmith (Hampshire House) Photographic Society. "Down the Thames on a Barge." W. N. Beal.
The Camera Club. "Egyptian Jewellery." Prof. W. M. Flinders Petrie.
Richmond Camera Club. "The Engraved Works of J. M. W. Turner, R.A." Dr. C. W. Philpot.
Brighouse Photographic and Naturalist Society. "The Importance of Photography in the War." A. Dordan-Pyke.
Aston Photographic Society. "Enlarging." Mr. Leith.
Wimbledon Camera Club. "Personal Practice in Pictorial Printing." E. C. Perry.

THE PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

A MEETING of the Council was held at 35, Russell Square, on Friday, October 10, 1919. Present: Angus Basil, Gordon Chase, A. Corbett, C. F. Dickinson, Alfred Ellis, S. H. Fry, W. E. Gray, Reg. Haines, Geo. Hana, Lang-Sims, R. N. Speaight, H. St. George, and F. G. Wakefield (London members), and Marcus Adams (Reading), F. Brown (Leicester), W. B. Chaplin (Windsor), A. H. L. Chapman (Swansea), Tom Chidley (Chester), and W. Illingworth (Northampton).

The minutes of the previous meeting were read and confirmed. Letters of regret for non-attendance were read from F. Read (Southport), and Montague Cooper (Taunton).

The Chairman offered the congratulations of his fellow members to Mr. Geo. Hana upon his recovery from a very serious illness, and expressed their pleasure at his presence once more at their deliberations. Mr. Hana thanked the members for their expression of goodwill and good wishes.

The Hon. Sec. reported that in accord with the Council's instructions he had inserted an advertisement in the "British Journal of Photography" stating that the Association required the services of a gentleman as paid secretary. He (the hon. sec.) had received

twenty-three applications for the post. As notified on the notice of agenda, these letters had been laid upon the table for an hour before the present meeting, so that every member had had the opportunity to make himself fully acquainted with the details of the applications. The Council would have now to decide what salary they were in a position to offer as remuneration, and he proposed that a small committee—a finance committee—should be appointed to make a recommendation on this point to the Council. The proposed committee might, at the same time, select the most suitable candidates, and the Council could then make a final choice.

A short discussion ensued, and Mr. R. N. Speaight moved, and it was carried unanimously, that Messrs. Corbett, Hsines, Lang-Sims, St. George, Ellis, and the hon. treasurer be appointed to form the finance committee and to report to the next meeting.

The Hon. Treasurer reported that subscriptions were coming in satisfactorily, and that the number of members who had made any protest against the increase in the amount from 5s. to 10s. was negligible. As a matter of figures, less than ten members had resigned their membership out of over seven hundred payments received in the first nine months of this year. A great many more members had written congratulating the Council upon the increase of the amount, and some wishing the subscription were greater. His present position was, that he was sure of being able to present the members with a good statement of income and expenditure for the year ending 1919.

The Hon. Treasurer placed the bank pass-book on the table for inspection by the chairman, and asked the Council to authorise the drawing of cheques for accounts due to the amount of thirty-one pounds odd; agreed.

The Kodak Company having offered to give a demonstration of their Portrait films to the Council, it was suggested that the demonstration might be given as one of the features of the Congress as well as to the London members before Christmas. Some discussion arose as to the functions of the Association, and possible complaints from country members that Londoners looked after themselves first. The hon. sec. said that he thought that the days of jealousy between London and country members had passed. Speaking for himself, he believed the Association meant to do, and was doing, all that it could do for each and all of its members, town and country alike. Nine-tenths of his work as hon. sec. was with country members, and he thought there was nothing in the point. It was resolved that the Council accept the kind offer of the Kodak Company.

The reports from members of the Council instructed to ascertain the effect of incorporation upon the future official relations of the Association with Government Departments were presented, and amounted, briefly, to a statement that the relations depended, not upon the matter of incorporation, but upon the importance of the trade interests from the national point of view, and upon the status, social and commercial, of the parties interested. The introduction or intervention of a "persona grata" was practically the only and the best method of getting into touch with officialism when such a course became advisable. The Council were fortunately in the position of having such introductions. It was pointed out that other reasons would probably operate to lead the Council to decide to become an incorporated body, notably the intended appointment of a paid secretary and the desire to limit the personal financial responsibility of the members, as well as that of the Council and officers.

Mr. St. George (President) said that the Council were indebted to Mr. Illingworth for having taken a great deal of trouble in this matter. At the present moment they had a good many "irons in the fire." He would like to see the matter of the secretaryship out of the way first. The Council agreed, nem. con.: That the further consideration of this matter be deferred until after the question of the employment of a paid secretary by the Council has been settled.

A complaint was made by a member that he was unable to buy roll films from the Kodak Company at trade prices. He claimed that his trade in developing and printing the film, which was strictly photographic work, was prejudiced, as customers required their cameras to be reloaded with film, which he was unable to supply, thereby losing the business of developing and printing, which was diverted to a neighbouring chemist. Members of the Council related instances of this practice working to their prejudice, and stating that such trade regulations gave an unfair advantage to chemists and others. Mr. Chidley discussed the matter from his own experience in the matter of cameras, and stated that he should have lost the sale of a high-priced camera (Kodak) had he not been able to purchase a similar piece of apparatus for his customer from another maker. The further consideration of the complaint was adjourned.—Mr. Hana asked the hon. sec. what was the result of a somewhat similar complaint, viz., withholding goods in restraint of trade, which had come before the Council at its last sitting before the adjournment. The Hon. Sec. stated that the principle of the complaint was unsettled, but the particular complaint had been met by the wholesale house supplying the goods as required by the member.

The Hon. Sec. reported that a variety of letters and complaints had been received by him during the recess. These had all been dealt with in consultation with such members of the Council as were available at the time. The cases included claims against a railway company (put into the solicitor's hands), several cases of refusal to pay copyright fees (now collected), rights in negatives and copyrights in negatives made from aeroplanes, claims against manufacturers for overcharges, claim against vendor of a business for breach of agreement, several complaints against trade printers for non-delivery of prints and retention of the negatives, and complaints against manufacturers of dry-mounting tissue. The Hon. Sec. further reported that Mr. Arthur Brooks had informed him that there was practically no doubt that the Photographic Fair would be held at the Royal Horticultural Hall some time in April, 1920. The Congress of the Professional Photographers' Association might be therefore regarded as a certainty.

An extra meeting of the Council has been called for Thursday, October 23, to receive the report of the finance committee in the matter of the appointment of a paid secretary.

ROYAL PHOTOGRAPHIC SOCIETY.

MEETING held Tuesday, October 21, Mr. F. F. Renwick in the chair.

The twenty-second Traile Taylor Memorial lecture was delivered by Rev. A. L. Cortie, S.J., F.R.A.S., director of the Stonyhurst College Observatory, who took as his subject "Photographic Evidence for the Formation of Stars from Nebulæ."

Father Cortie did not attempt to deliver a highly technical discourse upon this branch of astro-physics to which, among other fields of astronomical research, he has devoted himself. Yet within the limits which he set himself of popular exposition he was eminently successful in bringing most vividly before his audience the lines of thought and investigation which had been followed by astronomers in dealing with the final and most elemental riddle of the universe, the formation of stars and suns from gaseous nebular material. With the aid of a magnificent series of photographs of stars and nebulæ the lecturer traced the two descriptions of evidence, which gave a reasonable ground for belief that the coalescence of nebular matter into definite stellar bodies is a process which may be seen in operation. Such evidence consisted in the photograph of nebulæ, and particularly those of spiral nebulæ, in which the physical formation or structure of the nebulous matter shows a direct physical connection with the disposition in the heavens of luminous stars. Along the other line of investigation, that of the spectroscopic analysis of the material of nebulæ and stars, the evidence in favour of the formation of the latter from the former was still more positive. Father Cortie, in dealing with this branch of his subject, showed many of the spectrum photographs of stars and nebulæ made at Stonyhurst College Observatory, and pointed out how the astro-physicist was ahead of the terrestrial chemist in the discovery of new chemical elements. The spectroscopy of the stars had shown the existence of helium long before the gas was isolated in the laboratory, and there were now several elements the properties of which had been fairly well defined by spectroscopic methods, which were known to exist in stars of nebulæ, but have not yet been isolated by chemists from terrestrial material. Without resorting to the expedients of picturesque illustration which are familiar to those who have heard the lectures of the late Sir Robert Ball, Father Cortie nevertheless succeeded in keeping his audience impressed, indeed overwhelmed, with the vastness of his subject, and when at last he turned for a moment to draw the inference of a beginning of

the universe, designed and regulated by something of a higher order than matter, some great spiritual power, it was felt that he had brought his discourse to a fitting conclusion.

On the proposition of Mr. D. E. Benson, seconded by Mr. E. W. Mellor, the hearty thanks of the Society were accorded to Father Cortie, and the medal struck by the Traill Taylor Memorial Committee was handed to him by the chairman for his acceptance.

The lecturer, in briefly replying, quoted, in the vernacular, some opinions of Lancashire artizans of the work of his observatory. It was evident that the astronomer-priest was a very human person.

CROYDON CAMERA CLUB.

Mr. J. Dudley Johnston gave a lecture on "Personal Practice in Lantern Slide Making," being a repetition of an exposition at the R.P.S., fully reported at the time.

The rooms were crowded, and the opinion of everybody, including the veterans, was that no finer collection of slides had ever been seen in the club. Add to this the fact that Mr. Johnston proved to be a most lucid lecturer, dealing very clearly with every step necessary to success in the most beautiful of all photographic processes, and it will be realised that lucky is the society which can prevail upon him to appear before it.

An unusual feature of the evening consisted of a strong counter-attraction in the shape of an exceedingly fair young lady visitor, who quickly absorbed the Croydon atmosphere and dry ginger-ale, and chatted in friendly fashion with one or two members in the immediate vicinity, much to the envy of those unfortunately situated in remoter spots. If ladies were permitted as members and the club included within its ranks femininity of the same order, doubtless its membership would be quadrupled in a very short time, and of an equal certainty attention directed to the lecturer would be reduced to the vanishing point.

In the discussion, Mr. H. P. C. Harpur (an expert lantern-slide maker) spoke at length and most appreciatively, but ran into more dead-ends than customary, from which he retreated with difficulty. Necessary explanations to the puzzled fair visitor that this erratic procedure merely indicated genius of a rare nature caused the gist of Mr. Harpur's remarks to escape attention and remain unrecorded. Mr. W. F. Slater struck a new note by saying that when intensifying with silver he had on occasion obtained a "Liberty" art green deposit, and a very nice colour too. A most hearty vote of thanks to the lecturer concluded a most interesting and instructive evening.

News and Notes.

Historic Photographs by Lord Kitchener.—During the past week or two there has been offered to habitués of a London thoroughfare famous for its stocks of second-hand books a volume, or album, of photographs of Palestine taken by the late Lord Kitchener in the days when he was a lieutenant in the Royal Engineers, at which time (the middle 'seventies of last century) he was an enthusiastic worker in the Holy Land. Many photographers, bibliophiles, and others who have examined the volume probably learned for the first time that Kitchener was an author and a photographer. The apparent uniqueness of the book, combined with the present-day interest in Palestine, has led the vendor to over-value his possession considerably, and to offer it at an inflated price, for the book, little known and aged as it may be, is not yet out of print; it may still be obtained from the publishers at the original price of one guinea. A correspondent who has photographed in Palestine, in sending us this item of news, further states that he has gleaned from the reports of the Palestine Exploration Society that this volume of "Photographs of Biblical Sites" was published by the Society in 1876. It contains twelve pictures taken by Kitchener during the time he was at work on the survey of Western Palestine, together with a short description of each written by himself. Some of the views taken are no longer obtainable, as new buildings of one kind or another have sprung up everywhere, altering or marring the old and historic sites. The descriptions, though very short, are charmingly written, and show what a strong feeling Lord Kitchener had for this particular part of the Near East. It appears (says our correspondent) to have been his only photographic effort, and he took the keenest interest and pleasure in the preparation of this his only book, as his letters show, though the actual publication of it was left in Sir Walter Besant's hands, as the author returned to Palestine before it was in proof. If the negatives still exist—as in all probability they do in the wonderful archives of the Society—they should be of great value to-day, when the Holy Land and its sacred sites are attracting the attention of the whole of Christendom in a way they have never done before.

Presentations to a Postal Club Secretary.—Twenty-one years ago was established the Somerset Postal Photographic Society, and during the whole of that period the duties of Honorary Secretary have been faithfully and courteously discharged by Mr. Bernard J. Mitchell, of Frome. The members very naturally desired to show their appreciation of his excellent services, and the suggestion of Mr. A. W. Walburn, of Exeter, was adopted that a presentation album should be prepared containing from each member a print, portrait, and autograph, in addition to a silver tea service, and a gold wristlet watch for Mrs. Mitchell. It was arranged that the presentations should take place at the Salon, but owing to the railway strike postponement was necessary, and the very happy event took place at Bristol on October 15. This was the first meeting that had ever taken place in connection with the Society, the majority of the members being quite unknown to each other except through the circulating portfolios, and the gathering was, therefore, of quite a striking character. Another unique feature of the proceedings was the fact that Mr. Walburn was elected a life member of the Society—quite a new thing in postal photographic societies—and the meeting was in every way a happy and successful one.—In acknowledging the gifts, Mr. Mitchell said it was extremely difficult for him to find words carrying sufficient weight to express his feelings of thanks and appreciation of the kindly thought prompting the organisers of the presentations. The Society owed much in its early days to the kind assistance of the late Mr. Hawes, Mr. Hugh Price, of the British P.C., Mr. F. M. Sutcliffe, Mr. Barran Keene, Mr. J. T. Ashby, and several others. The membership had comprised many well-known workers—Mrs. Mary Cottam, Miss Constance Ellis, Dr. Rosenheim, Rev. Mudie Draper, Mr. S. G. Kimber, and others—who had figured at the Salon and Royal. Working the Society had been to him a labour of love, and the gifts would be treasured as long as life lasted as a reminder of the pleasure his work in the Somerset Society had afforded others during his tenure of office.—Mr. and Mrs. Mitchell afterwards entertained the members to tea. Amongst those present were members from Weston-super-Mare, Clevedon, Bristol, Newport, Risca, Hereford, Bridgewater, and Castleford, Yorks.

Correspondence.

**** Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

**** We do not undertake responsibility for the opinions expressed by our correspondents.*

REVERSAL OF IMAGE IN DISH DEVELOPMENT.

To the Editors.

Sir,—Referring to this question, I also have had a curious experience. One night I was developing a roll of films (Kodak) with Certinal developer, and white light struck one end of the film. After the film was fixed I noticed that the two end exposures were positives. I wondered why. I developed another Kodak film in the same developer and towards the end of development allowed light to play on film for about a minute, still passing through the developer. Result, all positives. The exposures were all outdoor ones.

I have had reversal of the image on one or two occasions where no light has penetrated, but only within the last six months. It may be the emulsion used is different from that of last year, perhaps some improved method of Kodak's or possibly may be due to developer.

I have no facilities for going further into the matter, but these pointers may be useful to experimenters. I simply give my experience.

I noticed in a recent number a "new" method of toning with acetate of lead. I toned with acetate of lead (and it is on record in an amateur journal) twenty-five years ago. I also got good results with barium salts.—Yours faithfully,

The Huts, Victoria Falls, Rhodesia. PERCY M. CLARK.

STRIPPING-PLATES FOR TITLES ON NEGATIVES.

To the Editors.

Gentlemen,—With reference to your reply to "O. A." in the "British Journal" of October 17, it may be of interest to your correspondent to know that Gem stripping-plates (in lantern and "process" rapidities) are manufactured specially to provide a handy and sure method of putting titles on negatives.

A lot of titles, as you remark, may be photographed on one plate, which is developed, fixed, and dried in the usual way. A sharp penknife is then passed round the plate about a quarter of an inch in from the edge, and the film is detached without further treatment.—Yours faithfully,

THE GEM DRY PLATE CO., LTD.

Cricklewood, London, N.W.2, October 20.

BUYING SECOND-HAND LENSES: A CAUTION.

To the Editors.

Gentlemen,—Nowadays, when new lenses of all kinds are very expensive and somewhat rare, would-be purchasers of objectives are turning their attention to stocks held by dealers in second-hand goods, particularly pawnbrokers. For many years pawnbrokers' shops have been good places to patronise for lenses, and some very good bargains have been secured by myself and others. Most of the pawnbrokers are fully alive to the value of photographic lenses, but they, as a whole, deal fairly, and I have met with no attempts to profiteer.

Last week a small R.R. lens was purchased for 17s. 6d. (new 25s.) at a South London shop; when examined in the hand—and very closely, too—it appeared to be quite all right, and the name of a well-known London maker engraved upon the mount gave one confidence. When fitted to a camera, however, the lens failed to give any kind of image, a further examination proving that the lens had no useful focus, although the inscription cut upon the brass mount gave it as being 6½ inches.

The makers of the lens were communicated with, and from them I learned that it was the fifth "dud" of the species they had heard about during the last week or two, all of which had been purchased from pawnbrokers. The affair at the moment is something of a mystery, and more may be heard of it later on as there are believed to be many more such lenses in the hands of London pawnbrokers.

Judging from the facts at present available, it appears that during the rush of war work—when the making of ordinary lenses was suspended and hosts of strange hands were engaged on munition work in lens factories—some dishonest workman "lifted" a few mounts bearing the name of the firm, and, knowing of the scarcity of photographic objectives, fitted into them any lenses he could find to fit, and "planted" them with pawnbrokers who, of course, had no time to try them in a camera. Purchasers of lenses from "Uncle" would therefore do well, for the time being at any rate, to pay a deposit and have the lenses on approval.—Yours faithfully, L. T. W.

Commercial & Legal Intelligence.

NEW COMPANIES.

PEERLESS PHOTO PAPER CO., LIMITED.—This private company was registered on October 14 with a capital of £17,500 in 15,000 shares of £1 each, and 50,000 shares of 1s. each. Objects: To carry on the business of manufacturers of and dealers in photographic paper, etc. The subscribers (each with one share) are:—H. A. Nutland, 113, Redforth Avenue, New Malden, Surrey, company registrar; J. A. Ratray, 2, Commaes Cottages, Hemel Hempstead, solicitor's clerk. The first directors are to be appointed by the subscribers.

Answers to Correspondents.

SPECIAL NOTICE.

In accordance with our present practice a smaller space will be allotted to replies to correspondents.

We will answer by post if stamped and addressed envelope is enclosed for reply: 5-cent International Coupon, from readers abroad.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

J. D.—Some samples of persulphate do not work until a little acid is added, say, two or three drops of 10 per cent. sulphuric acid to each ounce or so of ammonium persulphate solution.

S. A.—Water-colours are largely used without any medium for colouring bromides, the prints being simply prepared by rubbing lightly with purified ox-gall. Perhaps you have in mind the wax medium for water-colours which is now used and is obtainable from Mr. V. Godbold, 98, St. Asaph Road, Brockley, S.E.

W. N.—We think the best book for your purpose is "Photography of To-Day," by Chapman Jones, which you can buy through our publishers, price 8s. You will find something there on the earliest genesis of the camera, which, of course, is several hundreds of years older than photography, and also enough on lenses for your purpose.

C. C. S.—1. We do not know any make of reflex camera in which plates are carried in a magazine. So far as we know, no camera of this kind has ever been put upon the market, and we hope it never will, for it would be abominably heavy in anything but the very smallest sizes. 2. We are sorry we cannot identify the "Flexit" camera, either as a reflex or other type.

H. W.—There is now no formality necessary or possible in order to establish copyright on a legal basis. If you have taken the photograph "on your own" you automatically become the owner of the copyright. If, on the other hand, you are paid for taking it, the copyright becomes the property of the person who paid you, or even the person who ordered you to take the photographs.

W. M. A.—You should certainly have received a fee for reproduction of each of the photographs, the minimum fee being 10s. 6d. It is not the custom of newspapers to return prints which have been reproduced. If we were you we should simply write a note pointing out that prints, the copyright of which is your property, have been reproduced in such-and-such an issue, but that apparently the payment to yourself of the fee for reproduction has been overlooked.

J. G.—Formulæ for glazing solution is somewhat a matter of mixing and trying how it works. The basis of glazing solutions is ox-gall, which you can buy in a purified state from Messrs. Rheinlander and Sons, Rodney Road, New Malden, Surrey, or prepare for yourself according to the instructions given in the "B.J." of June 6, 1919, page 316, obtainable from our publishers, price 4½d. post free. Formaline is often mixed with the ox-gall, and so also is a certain proportion of alum, but in our experience ox-gall alone is as good a glazing solution as any.

W. S.—You do not tell us the height or other dimensions of the room, so we cannot advise you very well as to the artificial light, but it looks as though for your stickyback work a single 2,000 candle-power half-watt lamp or one of the Toplight arc lamps of the Westminster Engineering Company would be the best for your purpose. You had better write to the Westminster Engineering Company, Victoria Road, Willesden Junction, London, N.W., and to the General Electric Co., Limited, 67, Queen Victoria Street, London, E.C., as regards their half-watt lamps.

W. B. C.—You will not get half-second exposures with two blow-through lime jets, nor, we should say, with half a dozen. The candle-power of the average oxy-hydrogen lime is approximately 500, and you want about 3,000 candle-power at least for really quick exposures under the conditions you mention. The light is

about the least suitable for illumination of a figure for portraiture owing to its extremely concentrated form. So far as we know, there are no measurements, even rough, of the candle-power of magnesium ribbon, but it gives, we should say, about 800.

S. H.—Oil lamps are a very long way behind a decent incandescent gas burner for enlarging. You are certain to find that exposures are inconveniently prolonged, and you will have some difficulty in getting uniform illumination with the three-wick lamps supplied to ordinary magic lanterns. Our opinion is that if you figure it out you will find that the price of gas has very little effect on the actual cost to you of the enlargements, but if you must have another light, about the best is the "Luna" lamp made by Messrs. W. C. Hughes, 82, Mortimer Road, Kingsland, London, N.1. This burns methylated spirit and probably costs as much to run as incandescent gas.

N. H.—Without having tried it, we should think that a celluloid coating would not work for transfer paper, as it would not give sufficient adherence between the two films. Probably the cause of your veiling of the high-lights is due to colour in the gelatine. Do you use the finest emulsion gelatine? As regards the true-to-scale process, the blue-print is applied dry and removed dry from the gelatine mixture, which is then inked up and impressions taken by contact. There is no wetting at any stage of the process. But it is not a process for reproducing drawings in colour unless you are ready to go to the trouble of inking up different parts in different colours. You could do that, but it would be a laborious business.

P. E. W.—We think the action at Blackpool was taken entirely under a municipal by-law. In some districts the police certainly do require photographic touts who go from house to house to have a hawker's licence, but the police practice in this respect varies considerably in every district. We expect you will find that your local authority considers that it has rights in regard to permitting photography upon the beach, and is ready to dispose of them to individual photographers for an agreed sum. As regards the pierrots, it is pure rubbish to say you are infringing any rights in making such a photograph as you have or in making any use of it. Having taken your photograph, you are the sole owner of the copyright in it, and, short of it being libellous, there is no restriction which can be put upon its use by anybody.

E. W.—There is no better colour than white for the dark-room walls so long as your illumination is safe, and if the illumination is not safe then no colour of the walls will make it safe, although it may, perhaps, help matters a bit. You cannot do better than have the walls painted or papered white, but be particular in having a proper safelight for the dark-room lamp and not ordinary ruby glass. If we were you, we should avoid daylight illumination altogether, but that is, perhaps, a matter of opinion. In any case, see that you have a yellow fabric as well as a ruby window for daylight use, and that you fix the fabric so that you can renew it from time to time, as it is liable to fade in the light. A ruby glass window for use in daylight, unless specially tested for safety, is liable to give fog.

H. F. C.—For critical definition at a large aperture to the corners of a half-plate, we are afraid there is nothing for it but one of the $f/4.5$ anastigmats of at least 8 inches focal length, preferably 9 or 10 inches focus. If bulk of copying apparatus is not an objection you could no doubt get a second-hand portrait lens of about 12 or 14 inches focus which would answer the purpose as well, and probably be distinctly more rapid. At the same time, you may be able to buy second-hand at a price a good deal below an anastigmat. If we were you, we should see what a firm of second-hand dealers could do for you in the way of the portrait lenses before deciding on the anastigmat. We have no doubt that if you put your requirements to them they would allow you the opportunity of trying three or four lenses for your purpose.

L. W.—If you are taking portraits and are being paid for doing so, there is no reason why you should not be given the customary professional discounts by suppliers of photographic goods. The best thing would be for you to have a temporary trade letter heading printed, and take up the question with one or other of the leading houses, such as Messrs. Houghtons, Griffins, or Kodak. If you trade under your own name it is not necessary for you to register your business, but under the present Retail Businesses Licensing Order you require to obtain a licence whether you are carrying on the business at a studio or simply doing it at people's houses or wherever it is convenient. It does not matter that the place where you are now working is private; the essential thing is that you are carrying on photography locally, and that is permitted only by licence, the office for which is 80, Westbourne Terrace, Paddington.

A. F.—We assume from your letter that electric light is not available, so that you can only adopt some system of gaslighting. This will be rather difficult in a width of 7 ft.; and, if possible, we should advise you to place the dark-room elsewhere. There are two systems in common use: one is the Howellite and the other the Kodak. We should think it might be better in your case to dispense with a stand and fix a series of Howellite burners on the wall. If you send to Messrs. Griffin, Kemble Street, Kingsway, they will send you particulars and prices of their lamp (the Howellite). You should also ask for prices of burners separately. In any case there will be a considerable amount of heat, but this will hardly be an objection for the next few months. Cameras such as you require can be obtained from Messrs. Billcliff, Richmond Street, Boundary Lane, Manchester; or Messrs. J. Fallowfield, 146, Charing Cross Road, London, W.C.2.

A. J.—1. You will require to obtain a licence, the office for which is Harewood Barracks, Woodhouse Lane, Leeds; but you must bear in mind that this Order was made for the benefit of men like yourself, who have been in one or other of the Services, and, therefore, you should experience no difficulty in getting a licence. 2. There is no disadvantage except the extra cost in having five lamps instead of three, and you will naturally be able to give shorter exposures. If you do not require all the lights at once you will be able to vary the effect by switching off one or two, as may be necessary. The arrangement you mention will answer very well. The front lights should be about 8 ft. from the floor so as to give enough top light; the side ones may come lower—say, 6 ft. The front light should be about 8 ft. from the background and the nearest side light, say, 4 ft. 6 in. or 5 ft. If you can make them all to raise and lower it will be better. Do not have bright reflectors; the enamelled iron ones sold by the General Electric Company are the best for the purpose. Failing these, have white distemper, or even card reflectors. We should not advise white walls; it is better to have white reflectors where you need them for the shadow side. White or very light walls may give a flat effect.

The British Journal of Photography.

The Oldest Photographic Journal in the World.

PUBLISHED EVERY FRIDAY. ESTABLISHED 1854. **PRICE TWOPENCE**

TERMS OF SUBSCRIPTION, POST FREE.

UNITED KINGDOM.—One Year, 10s. 10d.; Six Months, 5s. 5d. Three Months, 2s. 9d.

CANADA ... ...
AUSTRALIA ... ...
NEW ZEALAND ... ...
SOUTH AFRICA ... ...
UNITED STATES OF AMERICA
SOUTH AMERICA ... ...
INDIA AND FAR EAST ... ...
CONTINENT OF EUROPE ...

One Year. Thirteen shillings (13s.), or 3 dollars 17 cents, or 22 francs, or 9 rupees 12 annas, or 6 yens 30 sens.

FEDERATED MALAY STATES, BORNEO AND SARAWAK 5 dollars 57 cents.

HENRY GREENWOOD & CO., LTD., Proprietors and Publishers, 24, Wellington Street, London, W.C.2.

IMPORTANT NOTICE TO READERS.—Until further notice agents will supply the "B. J." to order only, as the high price prevailing for everything in connection with newspaper production prohibit the distribution of surplus copies for chance sales. It is therefore necessary in order to ensure the regular delivery of the "B. J." each week to place an order definitely with a dealer, newsagent or bookstall clerk, or to send a subscription to the publishers.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3104 Vol. LXVI FRIDAY, OCTOBER 31, 1919. Price Twopence.

Contents.

	Page
Ex-Cathedra	629
Fixing and Washing Negatives.	630
The Exhibition of the Royal Photographic Society	631
Practicus in the Studio. By Practicus	633
New Business Uses for Commercial Photographs. By G. D. Crain, Jun.	635
The Comparison of the Density of Negatives. By H. W. G. Bidgood	637
The City and Guilds Examinations in Photography	637
Patent News	639
Analecta	640
New Books	640
New Apparatus, etc.	640
Catalogues and Trade Notices	641
Meetings of Societies	641
Commercial and Legal Intelligence	642
Correspondence— Fradelle and Young's Flashlight Photography—A Photographer's Club for Liverpool—Sensitising Canvas — The Eternal Question	642
Answers to Correspondents	643

SUMMARY.

At the meeting of the Council of the Professional Photographers' Association it was announced that the present honorary secretary has been appointed to act as paid secretary of the Association for the year ending December 31, 1920. (P. 641.)

The City and Guilds of London Institute, in agreement with the Board of Education, have withdrawn Grade I. of the examinations in pure photography and photo-mechanical processes so far as England and Wales are concerned. We give the syllabus of study prescribed for the Grade II. examinations which will be held in May next. (P. 637.)

It is reported that the Essen firm of Krupp is taking up the manufacture of photographic apparatus. (P. 639.)

A method of engraving finished Bromoil prints so as to simulate the effect of copper plate etching is among the regrettable war-time products of an enemy country. (P. 630.)

A method, described as the only satisfactory one, of using the persulphate reducer was mentioned by a speaker in a Croydon Camera Club discussion. (P. 642.)

In a leading article we deal with the general question of the effective fixation and washing of negatives. It is pointed out that thorough fixation is a necessary preliminary to effective washing, and that the latter operation can be done in a short space of time and with comparatively little water by working upon a rational system. (P. 630.)

The important uses which are being made of photographs in industry and sales-organisation are the subject of an article by Mr. G. D. Crain, jun., which we quote from "American Photography." (P. 635.)

In his article this week "Practicus" deals with the selection of an outfit for the beginner in professional studio and outdoor photography, pointing out the items which are of the first importance, and the selection of them which it is most advisable to make. (P. 633.)

A review of the scientific, technical, and colour sections at the exhibition of the Royal Photographic Society will be found on page 631. One of the most noteworthy exhibits is that of microscopically fine indelible scales on glass prepared for optical purposes by Messrs. J. and E. Rheinberg according to a process worked out by them.

In many studio establishments more attention is needed in keeping the dressing rooms in "nice" condition. (P. 630.)

The making of transparent sensitive emulsion and its use in processes of colour photography figure in "Patents of the Week." (P. 639.)

In the cold damp weather of the winter season, measures require to be taken to obviate unduly slow drying of negatives. (P. 629.)

EX CATHEDRA.

A Pioneer of the Road. The "B.J. Almanac" has long been a great traveller. The present generation of its publishers has unfortunately no means of ascertaining with any pretence to accuracy the stage in its career as an annual publication at which it began to find its way overseas in large numbers. But as years have gone by it has continued to penetrate more and more widely into all parts, even the most remote, of the civilised world, with the result that at the present day those of its 25,000 readers who are outside the United Kingdom outnumber those within it. Regular advertisers in the "Almanac" have come to appreciate the value of the volume in maintaining contact with these overseas customers as well as in establishing relations with many photographers whose first acquaintance with the resources of British photographic firms is made through the bulky yellow or green volume. It is this pioneer circulation which no doubt has been a large factor in maintaining and exalting the supremacy of the "Almanac" as an advertising medium for photographic goods through 59 years. Moreover, the links thus established between England and the many distant parts of the world by the distribution of the "Almanac" are something more than those created by the issue of an occasional circular or catalogue: universal experience is that each copy of the "Almanac" is kept and used for at least a year (often much longer), so that the link becomes really a channel of communication along which much business flows. It requires to be said in conclusion that the 1920 "Almanac" is now in an advanced state of preparation, and that instructions for the insertion of advertisements require to be received by our publishers without loss of time.

* * *

Negative Drying. As soon as damp cold weather sets in some workers find a difficulty in drying their negatives quickly and evenly, and sometimes unsightly marks are caused by attempting to dry off plates which are wanted in a hurry. If possible the rack should be carried into a warm room as soon as the surplus water has drained off, and allowed to remain there till the morning. A common mistake where many plates have to be handled is to place them too close together in the racks, so that the moisture cannot get away. If space is limited, it is a good plan to wipe the backs and to place the negatives in pairs with the films outside. By doing this, double the distance between the films can be obtained in the same length of rack. Another good plan is to pass the negatives through a weak formaline bath. This hardens the surface so that the film may be wiped with a soft cloth, after which the plates may be placed quite near to a fire or radiator without risk of melting. Where

a small electric fan is available it greatly facilitates drying even in a cold atmosphere. For "rush" or press work there is nothing to equal the old plan of using methylated spirit, but at present this is too expensive for ordinary use. A great economy of spirit is effected by dabbing off all the surface moisture before putting the plates in the spirit.

* * *

The Dressing-Room. In a large number, perhaps in the majority, of studios the dressing-room is not of the standard of the rest of the establishment, being a kind of "no man's land" which does not come under the care of anyone except the charwoman. Even if originally well appointed, the fittings, if not cared for as they would be in a private house, rapidly become dingy and produce a bad impression on clients who are used to living amid decent if not luxurious surroundings. The fittings and decorations of a dressing-room should be designed to show up dirt and not to conceal it, and to this end it is desirable that the walls and such part of the floor as is not covered with rugs or carpet should be finished in white enamel paint, which can always be restored to its pristine purity with a little soap and water. D'oyleys or any similar furnishings should be kept scrupulously clean, and a sufficient supply of combs and brushes provided to allow of clean ones being placed for the use of each sitter who needs them, although most "nice" people prefer to bring these articles with them. Photographers of all classes will do well to give an eye to this department more frequently than most do at present.

* * *

Enlarging Apparatus. If a suitable dark-room be available a very efficient and economical enlarging apparatus can be made by fitting a condenser into one of the walls at a convenient height and placing an incandescent gas or electric light upon a shelf or bench outside. An ordinary camera fitted with a negative carrier instead of the usual reversing back is fastened close to the condenser, and, except for the easel, the arrangement is complete. It is unnecessary to point out the advantage of having the illuminant outside the room, from a sanitary point of view, if gas or oil be used, while in any case there is no risk of light leakage as from a lantern body. If an electric arc be available, the condenser may be dispensed with and its place taken by two pieces of ground-glass placed about a foot apart. These will be found sufficient to diffuse the light if negatives of half-plate size or smaller are used. For larger sizes a pair of lamps placed one on each side of the opening, with a sheet of white card to serve as a reflector, will be needed. We have used this method for sizes up to 12 x 10 very successfully both for bromide paper and for making enlarged negatives and transparencies, as well as for ordinary lantern-slide work. It is easy to get sufficient distance even in a small dark-room by working right across the sink.

* * *

Engraved Bromoils. Apparently the restrictions on photography in the enemy countries during the war have been responsible for turning the energies of some photographers into fresh directions. One of these which should provide ample occupation for the long winter evenings is the suggestion of a method of hand-engraving the finished Bromoil print. The process is described at great length by a contributor to an Austrian journal. The Bromoil print having been finished and dried in the usual way is then worked upon with a sharp blade, something in the manner in which half-tone blocks are tooled by the photo-engraver—that is to say, the ink image is cut away in fine lines, so as to break up the image in some places with a white cross-hatching, in others by various engraving touches considered appropriate to the lines in the subject. A specimen of the result of this process, reproduced in photogravure, shows it to be a dreadful hybrid of full-tone photography and copper-plate etching. No doubt it will find a few exponents here among the people who cannot be satisfied with the photographic qualities of an oil or Bromoil print, but must make them into something else by various adventitious means. Perhaps the best feature of the process is that the cutting blade which is suitable for the engraving of the ink image is a most difficult thing to get. The Austrian writer describes his many unsuccessful attempts, and explains that in the end he had to have knives specially made for him by makers of surgical instruments.

FIXING AND WASHING NEGATIVES.

A CORRESPONDENT of the "Pharmaceutical Journal" recently asked for a hypo-eliminator for treatment of negatives after fixing. In reply, the following method was given: After washing the fixed negative under the tap for a minute, transfer it to a dish containing water with sufficient potassium permanganate to colour it pink. As soon as the colour disappears, repeat the process with fresh solution until the solution retains its colour. It was stated that with this treatment the negative would be ready for drying in three minutes. This is evidently an under-estimate of the time required in the case of a negative to be preserved, and, at any rate, if the hypo were decomposed the decomposition compound would remain in the film, and that might have some deleterious effect, physical or otherwise.

It is doubtful whether any method of eliminating hypo is as quick and efficient as the scientific application of plain water. Moreover, it is pretty certain that the presence of pure hypo in the film, in quantity insufficient to affect the gelatine physically by crystallisation, will be harmless. When a negative goes wrong, after having passed through the processes of fixing and washing, in consequence of something from the fixing bath remaining in the film, it is not often that hypo is the active material. It is usually the decomposition product of silver and hypo. The first essential towards securing permanency is to take steps to leave as little as possible of this silver compound in the film on leaving the fixing bath. To this end the fixing bath should be fairly strong and used in reasonable quantity. Also, it should not have been previously too much used. Having been properly fixed, the ideal way of washing is to arrange the plate, film downwards, just below the surface of the water contained in a vessel of some depth, say, 6 or 7 inches. The water must be quite still, and must not be agitated while the plate is in position. The hypo will dialyse out and will sink to the bottom under these conditions. At least 90 per cent., probably more, of the hypo will be removed in five minutes, and another five minutes will remove as much as can be removed if before drying the surface moisture be absorbed with a piece of fluffless blotting paper or of well worn linen or calico.

It is obvious that if the finished negative is to be used at once, and if also (its immediate purpose being fulfilled) its permanency is unimportant, there is no necessity for the same precautions that would have to be taken in the case of a negative of future value. The "while-you-wait" postcard photographer must necessarily work with extreme rapidity. His method is to employ a small plate which, after being developed, is fixed probably not further than to remove the visible silver bromide, etc., and after a perfunctory rinse is placed in the carrier of an enlarging lantern while still wet, and postcards made thus. Negatives made and used in this way are not

likely to stand. If they are required for future use they should be returned to the fixing bath as soon as possible, and left there rather longer than the usual time for fixation and then washed and dried. Nevertheless, it must not be thought that this deferred fixation is as good as full fixation in the first instance.

Although effective washing is important, complete fixation is of far greater importance. A small amount of pure hypo remaining in the film will not have any action, provided the negatives are stored where they will remain perfectly dry. Pure hypo, even in solution, does not act on the silver image except in the presence of oxygen or air. A plate fixed in a dipping bath may be left there many days without any apparent action, but a plate left in a flat dish covered with hypo solution to an eighth of an inch in depth will show signs of action after some days. The difference in the two cases arises from the more perfect aeration of the solution in the latter case. Hypo is a less dangerous enemy than it is generally supposed to be when it has no allies acting with it, but with silver it forms compounds of deadly activity. Such compounds are formed in the fixing bath. Fortunately, their power for evil may be restrained. The chemical action of the fixing bath—really a series of actions—is very complex. An endeavour will be made to describe such action without technical terms in order that all may understand. Assuming that the film of a plate consists of silver bromide and gelatine, it must be first understood that hypo solution does not dissolve silver bromide in the ordinary sense; that is, as water dissolves sugar or salt. The action is a chemical one, followed eventually by a solution in the ordinary sense. Probably the first action results in the formation of a silver compound in which the sodium of the hypo is replaced by silver. This silver compound is so unstable that, but for further action between it and a further supply of hypo from the bath, it would immediately decompose with the formation of silver sulphide. This decomposition resulting in silver sulphide is illustrated by what occurs when a piece of bromide paper is handled with fingers damp with hypo solution—a brown stain of silver sulphide. However, in the presence of more hypo this does not occur, but a combination takes place between this unstable silver compound and a further supply of hypo, resulting in a new compound containing both silver and sodium with sulphur and oxygen derived from the original hypo. This compound is nearly insoluble in water, but is soluble in hypo solution. It is colourless like hypo itself in that its presence is not visible, and it is to allow of the diffusion of this compound in the bulk of the fixing bath that it is necessary to leave the negative in the fixing bath for some time after the silver bromide has disappeared. The time allowed for fixation should be at least as long again as that required for the white silver bromide to disappear. If sufficient time is not allowed, that is to say if the plate is removed from the bath too soon, the result will be that even after copious washing some of this unstable compound will remain to manifest itself in time as a brown stain.

It will be clear from the foregoing that the fixing bath, after the fixation of every plate, becomes weaker in hypo while the silver compound accumulates. Fixation, therefore, takes place more and more slowly, and eventually the bath will cease to fix at all; but long before this stage is reached it should be discarded. A rough-and-ready test of the state of the solution is furnished by the fact that silver hyposulphite is an extremely sweet substance, many times sweeter than sugar, whilst hypo has a salt taste. If a finger be dipped in the bath and applied to the tongue, and there is the slightest perceptible sweetness, it is time to discard the bath.

To return to washing. A solution of hypo is heavier than water; if, say, 2 oz. of a fairly strong solution of hypo be introduced at the bottom of a vessel of water, say, a tumbler or 10-oz. measure glass, by means of a long-necked funnel and the vessel be placed where there is no vibration, diffusion will not take place for many days. It is difficult to see the state of the solution, being colourless, but if the experiment be made with a strong solution of table salt coloured with a few grains of dye it will be visible. This experiment will show that the least effective way of washing a negative is to leave it face upwards in a dish of water without motion. Running water is very much more effective, but a still better way is to rock the dish continually, and to change the water every two or three minutes, the washing extending over twelve to fifteen minutes. The ordinary rack washers, where the water is flowed in at the top and removed from the bottom, are quite effective if sufficient time be allowed. Prolonged washing does not improve negatives in any circumstances, and in hot weather it is particularly undesirable. With any reasonable system, half an hour is quite sufficient to remove everything that is removable.

THE EXHIBITION OF THE ROYAL PHOTOGRAPHIC SOCIETY.

SCIENTIFIC, TECHNICAL, AND COLOUR SECTIONS.

Although the technical sections at this year's exhibition are not large, they contain much interesting work. The great majority of this, however, consists of examples of the application of photography to nature study, radiography, meteorology, astronomy, etc. It may be said that the days are gone when an annual exhibition such as that of the R.P.S. can hope to contain many exhibits of fresh interest in the domain of pure photography. Of late years new photographic processes or designs of apparatus have been few and far between, and their rarity has its counterpart in the technical exhibits of this kind which are offered to the Society. Nevertheless, the present exhibition contains several. Without question the most notable of these is that of Julius and Ernest Rheinberg (No. 315), entered as "Grainless Photography and Filmless Photography." Apparently, the title of the exhibit refers to two distinct processes, but as no details of the methods are divulged the supposition is no more than speculation. But, taken altogether, the exhibit, which fully deserves the medal awarded to it, relates to the invention of a process of making exceedingly fine indelible scales upon glass. Such scales, under the name of graticules, were products (highly necessary for many optical instruments) which before the war were obtainable only from ex-enemy sources, and apparently were made by secret methods. Messrs. Rheinberg, at an early stage in the war, took up the investigation of methods of making these scales, and within a relatively short time brought their manufacture to a very high state of perfection. They show examples of many forms of scales, the lines in which, under high magnification, show no trace of granularity of structure, nor is such to be detected

in the vehicle, if any there be, which holds the design of the scale upon the glass. It is, in fact, stated in the catalogue that the finished product is innocent of any colloid film whatever, the lines being indelibly incorporated in the surface layer of the glass. There are no doubt good reasons for preserving secret the details of such an invention, but the fact of secrecy should not lead one to leave unexpressed the most sincere congratulations to the two investigators on their success in applying photography to a process possessing the highest value in the arts of both peace and war.

Perhaps the next most notable exhibit in the sphere of pure photography is the prints by the modification of the gum-bichromate process demonstrated some months ago to the Society by Mr. Herbert S. Starnes. These are Nos. 345 and 346, and show the results obtained by a sensitive coating consisting of gum senegal and pigment together with bichromate, alum, and hydrochloric acid. Mr. Starnes shows some coloured prints, which we assume to be simply examples of hand colouring, although perhaps the description of the process might leave it to be supposed that the colours are fixed in some way by a photographic process. Two prints by H. F. Farmer (Nos. 366 and 367) are by the modification of the Ozobrome process, which Mr. Farmer calls "Carbro." They serve to show in a modest way the excellent tonal quality obtainable by the process. Two exhibits which probably will interest teachers of photography more than anybody else are Nos. 288 and 289. The former shows side by side the effects of irradiation and of genuine halation in an emulsion film; the other is an actual photograph of the path of rays undergoing double total reflection in their passage through a glass bar.

An exhibit of much interest to spectroscopists is that of the spectra of the copper arc (Nos. 361 and 362) photographed on the new type of colour-sensitive Schumann plate worked out and manufactured by the exhibitors, Messrs. Adam Hilger, Ltd. Messrs. Hilger also show photographs (Nos. 363-365) illustrating the use of the Hilger interferometer for the testing of photographic lenses. The instrument, the use of which was set forth in last year's Traill Taylor lecture, is based on the principle of showing the errors in the wave surfaces delivered by a lens, a system which is of extreme delicacy in disclosing characteristic aberration.

Nature Study and Photo-Micrography.

These two classes of exhibit need to be grouped together, since the photo-micrographic work consists almost entirely of examples of animal or vegetable structure. Among the photographs of animal subjects taken on a small scale of magnification, the most notable are those (No. 200) of mosquitoes, by Hugh Main. They show the mosquitoes of malaria and yellow fever. A medal is awarded to the photograph of British mosses (No. 204), by A. W. Dennis. Other photographs of lichen and mosses are shown by the same worker. A considerable number of photo-micrographs are shown by J. H. Pledge, F.R.M.S., who receives a medal for his series (Nos. 242-244) of the gonidia of a lichen. These range in magnification from 40 to 3,500 diameters. Dr. G. H. Rodman is a large exhibitor of photo-micrographs showing sound organs of the Mygale spider and stages in the life-history of the cuckoo-spit insect. Another series of somewhat the same kind is that (Nos. 258-269) showing the anatomy of the frog, by J. G. Bradbury. Photo-micrographs by G. Ardaseer (Nos. 235-237) are of the seeds of plants, it being pointed out that the magnified photographs are of great service in determining if a sample of seed corresponds with the name under which it is sold and are a means of detecting its adulteration with other commoner and therefore cheaper seed.

X-Ray Photographs.

Radiography is represented by a large selection of exceedingly fine work by Dr. Robert Knox (Nos. 209-217), all of the human subject, and including a radiograph of the hand of an Egyptian mummy of 1500 B.C. But perhaps the X-ray photographs of chief interest are those by Dr. Knox in collaboration with Major G. W. C. Kaye, representing the examination of aircraft materials for flaws and defects by X-rays. The series (No. 232) marks the disclosure of knots, worm-holes, false packing, defective workmanship, and wrong construction in manufactured parts of aircraft such as spars and struts. Similar in kind are the two X-ray photographs (Nos. 230 and 231) by Hector Pilon and Geoffrey Pearce, showing in one case casting defects in the carburetter of an internal-combustion engine, and in the other the four sections of the cylinder of an engine.

Although not coming within the province of X-ray work, we may most appropriately refer here to the photo-micrographs of electric welds (No. 270) shown by Dr. B. Parker Haigh. These show sections of electrically-welded metal employed in structural work in ships, and were taken in order to emphasise certain faults, particularly brittleness in parts. In the case of the low-power photographs the surface of the metal was etched with nitric acid, whilst for the metal photographed at a high-power etching with picric acid was employed.

Meteorology and Astronomy.

Phases of cirrus clouds moving at two different levels are the subject of two photographs shown by G. Aubourne Clarke (Nos. 272-275). Mr. Clarke, whose long-continued work in the scientific photography of clouds has figured in previous exhibitions, also shows a striking rendering of cumulo-nimbus or thunderstorm clouds, and a very striking one, though in monochrome, of a rainbow accompanying a passing shower. A set of photographs showing the sequence of lightning flashes during a severe thunderstorm (No. 278), is the only other print of meteorological interest. It is by H. Hargrave Cowan.

Astronomical photography is but slightly represented. The Rev. A. L. Cortie shows a series of photographs of the spectrum of Nova Aquilae in 1918 (No. 276). The total solar eclipse of June 8, 1918, is the subject of three photographs (Nos. 279-281) by Professor Campbell, of the Royal Astronomical Society; whilst the amateur in this field of work is represented by F. Sellers, who contributes a series of lunar photographs (No. 277) taken with a reflecting telescope, of equivalent focal length about 20 feet, from the top room of an ordinary dwelling-house at Muswell Hill.

Colour Prints and Transparencies.

Three-colour prints make a small showing in the exhibition and are chiefly by the Raydex process. Of the prints by this process, the best are by John Bean (Nos. 341-344 and No. 356). The last named is a charming piece of work in the colour photography of flowers. There are two examples (Nos. 347 and 348) of the process of making three-colour prints from negatives of the Joly type, produced by a single exposure under a colour screen of linear mosaic pattern, details of which the exhibitor, Mr. S. H. Williams, recently published in a communication to the Society. The two prints are presumably superimposed gum or oil impressions, but no particulars are given of their origin. From the pictorial standpoint, by far the most effective colour prints are those (Nos. 357-360) by the Rawlings oil process, shown by A. Motteau. These evidently are not intended to be accepted as examples of three-colour photography, but are frankly the result of local application of coloured pigment inks to the faint photographic image.

In the collection of colour transparencies, the honours may be said to be shared by Mrs. G. A. Barton, Louis J. Steele, Lucien Talamon, and W. E. Gray. The latter shows but one example of the Autochrome process, but it is a particularly fine one of the brilliant colouring of "The King's Indian Orderly Officers" (No. 156). Mrs. Barton has indulged her fondness for pre-Raphaelite effects in her Autochrome work,

which technically is of a very high order. "The Blackberry Girl" (No. 170) and "Old-Fashioned Flowers" (No. 171) are examples, although we like best the study from Christina Rossetti's "Goblin Market" (No 178). In "Olivia" (No. 184) she has a very successful rendering of the very light tones of a white dress. One medal is awarded to Lucien Talamon for a large and exceedingly fine Autochrome portrait (No. 169) and another to Louis J. Steele for "Autumn Study" (No. 192).

Photographs of South Pacific Islands.

The library on the ground floor is occupied by a series of nearly 150 photographs by Thomas J. McMahon of scenes in the island groups of the South Pacific. Mr. McMahon is an Australian who has travelled extensively in the islands, and has witnessed the growth of many of them in industrial importance. His photographs, for example, of Nauru and Ocean islands, famous for their rich deposits of natural phosphate, bring vividly before one's eyes the immense natural resources of these far-away groups which, far from answering to the popular conception of jungle-covered islands inhabited by cannibals, are now almost as civilised as Cheltenham or Golder's Green, with their steam and electric railways and bungalows for the native labourers, fitted with bathrooms and electric light. The visitor to the Pacific who expects to see places such as he has read about in Herman Melville is likely to be just as much disillusioned as, for example, was the late Marcel Schwob, the friend and interpreter of R. L. Stevenson, on the visit which he paid to Samoa after Stevenson's death, attracted to the island by the latter's romantic pictures of it. But if romance has taken second place, industry continues to progress in these South Sea Islands, and Mr. McMahon's photographs usefully supplement the message of his series of lectures to the effect that we of the British race require to bestir ourselves in order to secure and maintain British industrial interests in the South Pacific.

Trade Exhibits.

In the hall of the Society's house are shown wall displays by a few photographic firms. Messrs. Kodak, Ltd., exhibit a number of enlargements on Kodak bromide paper from negatives on Eastman Portrait film taken by Mr. Will Cadby. Portraiture by several well-known professional and amateur photographers forms the exhibit of Messrs. Thomas Illingworth and Co., Ltd. The prints shown are on the Illingworth "Bromide de Luxe." The Autotype Company have a varied selection of carbon work, and Messrs. John J. Griffin and Sons, Ltd., show an attractive set of prints on their Noctona and bromide papers.

The exhibition continues open daily (Sundays excepted) from 11 a.m. to 9 p.m. until Saturday, November 29.

PRACTICUS IN THE STUDIO.

[Previous articles of this series, in which the aim of the writer is to communicate items of a long experience in studio portraiture, have appeared weekly since the beginning of the present year. It is not thought possible to continue the series to the length of that by the same writer which ran through the "British Journal" some years ago, but if any reader among the younger generation of photographers, and particularly those engaged as assistants, has a particular subject which might be dealt with, his or her suggestion will be welcomed. The subjects of the previous articles of the series have been as follows :—

A Talk About Lighting (Jan. 3).
The Camera and the Lens (Jan. 10).
Managing the Sitter (Jan. 17).
Backgrounds (Jan. 24).
Studio Exposures (Jan. 31).
Artificial Lighting (Feb. 7).
Printing Processes for Portraiture (Feb. 14).
Studio Accessories and Furniture (Feb. 21).
The Surroundings of the Studio (Feb. 28).
Studio Heating and Ventilation (March 7).
The Postcard Studio (March 14).
The Printing-Room (March 21).
About the Reception Room (March 28).
Home Portraiture (April 4).
Portable Studios (April 11).
Copying (April 18).
Handling the Studio Camera (April 25).
More About Lenses (May 2).
Enlargements (May 9).
Advertising the Studio (May 16).
Mounts and Mounting (May 23).
Business Methods (May 30).
Photographing Children (June 6).
Portraits of Elderly People (June 13).
Something about Lenses (June 20).
Hand Cameras for Professionals (June 27).
The Dark-Room and Its Fittings (July 4)
Plates and Their Work (July 11).
Apparatus Repairs and Renovations (July 18).
Posing the Head (July 25).
Intensifying Portrait Negatives (Aug. 1).
Workshop Jobs (August 8).
The Personal Factor (Aug. 15).
The Keeping of Negatives (Aug. 22).
Reduction of Negatives and Prints (Aug. 29.)
Leaky Roofs (Sept. 5).
Blinds and Curtains (Sept. 12).
Miniatures (Sept. 19).
Printing Portrait Negatives (Sept. 26).
Wedding Groups (Oct. 3).
Combination Printing (Oct. 10).
Flashlight Work (Oct. 17).
Flashlight Portraiture (Oct. 24).

THE QUESTION OF OUTFIT.

I have often been asked to give a detailed list or specification of articles necessary for commencing business as a photographer, and sometimes I have undertaken the task of selecting them, which is not quite such a simple matter as it might appear unless the question of cost can be entirely disregarded. In previous articles the subject has been touched upon principally in connection with cameras and lenses, but many other articles are required, so that the matter is worth returning to. It is unfortunately impossible to give even an approximate idea of prices, as in this direction everything is in the melting-pot, and we shall have to wait many months before we know what manufacturers intend to put upon the market, and what prices are likely to be. There is still a great shortage of materials such as wood, glass, brass, and other metals, and the wages question is still far from being settled.

First and foremost, we have to decide what articles come into our scheme, and I think it advisable to deal only with such as are needed in the actual production of the work, and to leave out such items as reception-room furniture, carpets, and shop fittings. I have before me an old "list of a photographic outfit," which commences with a glass-house or room in the garret, furnished with a skylight and concluded with hammer and nails, pins, needles and thread, and fire-irons, such weird things as stuffed birds and beasts and skeletons also finding a place. For the benefit of the

curious, it may be stated that this list appears in the "Silver Sunbeam," published in New York in 1879.

Manifestly, no single specification will suit every class of business, and even in the same class due regard must be paid to the amount of cash available, many articles which are very desirable but not absolutely indispensable having to be omitted when the funds are limited. I will take as my model what may be termed a good medium-class suburban or country business, where all varieties of work, indoor or outdoor have to be done.

In the majority of cases it will be found advisable to adopt 12 x 10 as the maximum size to be dealt with by direct negatives. Cameras of this size are not much more expensive than those for 10 x 8 or even whole-plate, and at any time a single job may be offered which would cover the additional cost. Therefore, as the first item in the outfit, I place a 12 x 12 studio camera. This should have long bellows extension, and in addition to two 12 x 10 slides be fitted with a repeating back attachment for cabinets, with two or more slides, each carrying two half-plates side by side; suitable inner carriers will allow of these slides being used for post-card or quarter-plate negatives. A shutter, worked by pneumatic ball and tube or Antinous cable, should be fixed inside the camera; either the velvet flap or Packard Ideal patterns are good and not liable to damage. The circular bellows shutter answers well as long as it is in good order, but it will not stand rough handling. The studio camera stand should possess considerable range from high to low positions. I prefer the Hana and Semi-Centennial stands on this account, as it is easy with this type to bring the camera low enough to photograph children playing on the floor. A good large focussing cloth, or, better, a canopy arranged to serve both as lens shade and focussing cloth, is a necessary accessory. Unless very short-sighted, a focussing magnifier should also be provided, as it saves unnecessary eye strain and ensures quick and accurate focussing.

Lenses are accountable for a large portion of the cost of a studio outfit, and great discretion is needed in choosing them, as the length of the glass-room has to be taken into consideration. Of the older type of portrait lenses focal lengths of about eleven and nineteen inches will be found most generally useful. Ross's No. 3 cabinet lens and the same maker's 13 x 11 Universal Symmetrical ($f/5.6$) or Dallmeyer's 3 B and 5 D Patent Portrait lenses are popular favourites. Just now these may often be obtained secondhand at about pre-war list prices. A lens of shorter focus for small work should be added if possible. Ross's No. 1 Cabinet or Dallmeyer's 2 B Patent, both about 8¼ inches focal length, with an aperture of $f/3$, would be a good choice. If the additional expense is not objected to anastigmats of approximately similar focal length and aperture to the portrait lenses already mentioned may be selected. There is now a considerable variety of these upon the market, and they require an expert to detect any difference in quality, so that I need not particularise them by name. No attention should be paid to the covering power claimed by the makers, as this would probably lead to lenses of too short a focal length being chosen.

A greater focal length than 19 inches is desirable if many large heads have to be taken, or if a larger plate than 12 x 10 be used, and for this purpose a portrait lens of 24 to 30 inches focus should suffice, as anastigmats of this size are not only very costly, but unnecessarily good in quality, fine marginal definition not being required.

One or more reflectors will be needed, as well as a couple of circular head screens, one of the latter being covered with thin white material, and the other with black gauze. Kodak, Ltd., and Marion and Co. list good patterns of these articles.

Backgrounds do not call for the outlay which was needed when elaborate scenery was used and a dozen or so at £3 to £4 each could be found in many studios. One each, white, black, and grey, will answer most purposes, and it is desirable to have these with a continuous foreground. A couple of smaller grounds graduated or with a suggestion of foliage will be found useful for heads and three-quarter lengths. The studio walls should always be decorated so that they can be used as backgrounds for groups or interior effects.

I strongly advise the provision of a head-rest. This may seem old-fashioned, but some of our younger workers are beginning to discover its value for standing figures.

Furniture may be acquired as needed, or rather as opportunities arise, as many suitable chairs, settees, and the like may be picked up at furniture shops. A beginner will do well to pay a visit to the showrooms of Kodak or Marion, where excellent reproductions of furniture suitable for portrait work may be seen. A good baby-holder, either in the form of a chair or to be placed upon a table, will save many anxious moments in the course of a year.

The dark-room fittings should be as complete as funds will allow, as makeshifts cost time, and time is valuable, even in a one-man business. Enamelled iron dishes are most economical and easily handled, and these can now be obtained in all sizes. Fixing should be done as far as possible in tanks, and good washing tanks for negatives and prints are a necessity. An enlarging lantern may well be fitted in the dark-room, although this may not be needed at first. If there is no great volume of work it probably pays better to give enlargements to a trade house.

A good set of measures, from 1 drachm to 20 ounces, and two sets of scales and weights, a small one with glass pans and a larger one for hypo, sulphite, and other heavy chemicals. The workroom must have a very firm table for trimming upon, and if dry-mounting is done a Merrett's trimmer is almost indispensable. The dry-mounting press should be as solid as possible, as less labour is required than with a small machine, which calls for dead pressure with little leverage to help.

It is needless to particularise such small items as plate racks, clips, blotting books, bottles, and retouching and spotting materials, although they have all to be bought and paid for, but I must say a word about the retouching desk. Do not economise upon this as far as size is concerned, remembering always that the desk is for the convenience of the worker and not merely a holder for the negative; the roughest deal frame two feet square is better than the elaborate mahogany toy, which measures 12 ins. or less over all.

Now for a few words on outdoor outfits. Here, again, I vote for 12 x 10 as the standard size, and, although smaller cameras are sometimes convenient, it is as well to be ready for large work from the beginning. Most group work, athletic, wedding, or otherwise, is done on 12 x 10 plates, and it is throwing away money to offer smaller work. I prefer the parallel-bellows pattern, but it is rather heavy for a single-handed worker, therefore a good, strong conical bellows camera will be most generally acceptable. Three slides should be provided, and I have found that an attachment for carrying half-plate slides in addition has been profitable.

At least two lenses are needed, and if possible these should be anastigmats, one of, say, 16 inches focal length and the other for wide-angle work about 7 inches. It is advisable to use lenses of which the separate components can be used at full aperture, after the style of the Holostigmats or Ross Combinable; lenses of this type may have extra components added to the set from time to time. If anastigmats are found to be too costly, the large lens at all events may be a rapid rectilinear *by a good maker;* such a lens should give satisfactory definition over the plate at an aperture of $f/16$, and this aperture is generally as large as the depth of an ordinary group will allow. The tripod should not be too light, and

should have a large head. Many cameras have had the baseboard split through being insufficiently supported by a small round tripod top. The outdoor focussing cloth should always be of rubber cloth, as this not only excludes light perfectly, but is a good protection in case of a sudden shower.

PRACTICUS.

NEW BUSINESS USES FOR COMMERCIAL PHOTOGRAPHS.

[As is perhaps generally recognised, the unconventional in thought and action makes headway more rapidly in the United States than in the older European countries. In photography the phenomenon has undoubtedly been a predominant factor in the development of pictorial work during the past twenty years; it can be traced also, although in smaller measure, in studio portraiture, and it seems now to be observable in the newer field of commercial photography. Support of this view is provided by two recent articles, which we print as one, by Mr. G. D. Crain, junr., in "American Photography," dealing with the industrial and commercial use which is being made of photographs. While it must be admitted that the demand for photographs to be used for such purposes as these must come from the customer, the opportunities for suggesting such uses are often open to the photographer, and it is therefore well that those of our readers who have an interest in the making of commercial photographs should keep themselves informed of the lines along which photography is being applied in other countries in industry and commerce.—EDS. "B. J."]

I.

THE well-known fact that demonstration beats argument in a dozen ways is responsible for the fact that photographs are used in business whenever a really concrete and definite image is desired. It is very well to use words to supplement the idea; but the picture, which, as has been well said, speaks a universal language, is a correct foundation to build on.

Manufacturers are studying accident prevention more carefully at present than they have ever done before. There are several reasons for this. The desire that every humane employer has to keep his workers safe from injuries has been responsible for much careful and painstaking research along this line; while the adoption of workmen's compensation laws in twenty-four States, and the certainty that many more will put such statutes into effect in the near future, has had not a little to do with the effort to remove the accident hazard as far as possible.

The rates for liability insurance necessarily go up as soon as compensation laws are made effective, the reason being that while damages are frequently escaped by the manufacturer in States where the common law defences of fellow service, voluntary assumption of risk, and contributory negligence may be pleaded, it is known in advance that payment must be made for accidents if a compensation statute has been put on the books. The knowledge of the definite, inevitable cost of accidents has put the prevention of them on what might be called a commercial basis, and has made it a matter of financial importance to every manufacturer to keep down the number of injuries inflicted by his machinery to the irreducible minimum.

The question which is most often presented in this connection is how best to show the operative of a machine its dangers and how best to impress upon him the need for care. A graphic suggestion is required and a constant reminder is also necessary. What fits the needs of the situation better than photographs? In fact, no other method can be suggested that will "fill the bill" so completely, so effectively, and so economically.

The writer recently visited a large cotton mill in a southern city, and was interested to note that on the walls of the plant, in all departments, are framed placards carrying photographs of the right and wrong way to perform certain operations. Under each picture was an explanation of the merits or defects of the method illustrated, the result being that the most ignorant or careless employé could not fail to appreciate the points made by means of the pictures.

A general hazard which was exposed was that involved in handling belts. The shifting of belts and the handling of transmission equipment generally form one of the greatest departments of accident production; and as this is a general hazard which exists in every manufacturing plant, it may be worth while to note the explanation which went with the pictures.

"Keep on the right side of pulley when putting on belts," said the placard. "In putting on a belt properly, the operator stands on the 'down' side of pulley, thus running, whose rim is moving toward him from the top. The chance of accident is practically removed by the exercise of ordinary care when putting on a belt from this side.

"In putting on a belt in the wrong way, the operator is standing on the 'up' side of pulley, and should he slip and his sleeve or some other part of his clothing be caught by a set screw, key, or some other projecting part of the pulley, or under the belt, he might get carried over shaft, or possibly wound around it.

"Always keep sleeves rolled up, as shown in both pictures."

The cotton manufacturer also had pictures dealing with special hazards which are confined to plants of that kind, such as the proper and improper way of operating a picker, the correct and incorrect way of shifting a card belt, the right and wrong way to start a lap machine, etc. With each pair of pictures went the accompanying explanations, which indicated in impressive style just wherein the dangers of the wrong side of operation lay.

An incidental feature of the photographs, which was of great importance, however, was the mode of dress and the manner of arranging the hair. The latter is a particularly important feature in plants where women are employed. The photographs taught the operatives that their sleeves should be kept rolled up, and that their hair should be arranged neatly on the top of the head, and not allowed to hang in a braid. The regulations regarding dress were, of course, rigidly enforced, and this feature of the hazard can be more easily eliminated through ordinary supervision than the dangers connected with machine operation, where a momentary slip by the operative may cause serious injury.

The insurance company which handled the risk of the cotton mill referred to complimented it highly on the use of photographs for the purpose of preventing accidents, and has recommended the same plan to other manufacturers. The officers of the company are likewise convinced that the plan, which has been in use for about two years, is an excellent one, the following comment being made on the system:—

"While we put up these photographs without knowing just what the results would be, we have found that they have reduced accidents measurably. We have had no accidents whatever on the cards or pickers, which formerly were responsible for frequent and rather serious injuries being inflicted. We feel that the graphic way in which the dangers have been called to the attention of our employés, so that the most unintelligent can see the proper way to operate the machines, should be given credit for a large part of the improvement in conditions. We find that our people as a whole are interested in the photographs, and while it is true that familiarity breeds contempt, and that the old hand may disregard the injunctions given through the announcements, the general results are sufficiently good to warrant keeping them in place."

The adoption of compensation laws, referred to above, is ultimately going to result in each manufacturing plant being rated for liability insurance exactly as it is rated for fire insurance—on the basis of the hazards which exist there, and not in the class as a whole. In other words, each risk is going to be analysed, and the plant which has adopted the most and best methods of reducing the hazard and preventing accidents will get the lowest rate.

The use of photographs in this connection, in view of the actual results which have been experienced, and in consideration of the strong commendation expressed by the liability insurance company

which handles the risk of the manufacturer whose plan has been described, would undoubtedly have to be considered as a factor in eliminating the hazard, and consequently a credit would have to be given in the rate.

The importance of this factor lies in the use which could be made of it as a selling argument. A commercial photographer in a manufacturing town, after familiarising himself with the situation in his community, could go out among the manufacturers and suggest that photographs be taken for the purpose of accident prevention, explaining that the plan has been tried by others, and has proved successful, and mentioning also the credit in the insurance rate which may be expected by resorting to this device. While the analytical rating system may not be in effect generally at present, it is being worked out, and ultimately will be almost universally used.

Machinery manufacturing concerns are among those who would find the photographic system a valuable one, as injuries inflicted through the improper operation of machine tools are usually rather serious. Woodworking plants also contain a number of hazards, and while many of them can be eliminated by the installation of guards, the method of operating the equipment is nevertheless a most important factor, and the use of photographs would have a vital bearing on the situation.

The live commercial photographer in a city of any considerable size could get enough business in this way to keep him going for months; and, in view of the importance of the use to which the pictures would be put, as well as the need of more than ordinary skill in making the exposures, a much higher rate than charged for ordinary work would be in order.

II.

The use of photographs in lieu of samples, or for the purpose of supplementing samples, is now being so rapidly extended that there is really no telling where it will stop. New lines are continually being added to those whose salesmen are equipped more fully with a judicious selection of photographs than their predecessors ever were with a battery of heavy trunks loaded with samples; and where is the photographer who is not prepared, once alive to the situation, rather to help the movement along by his own active work than to retard its development by lack of interest and initiative?

At first glance the textile industries, including all of the wide variety of manufactures which involve the use of woven fabrics, from suspenders to sweaters and from neckties to underwear, would seem to be a rather unpromising field for the work of the photographer who knows how to make samples show up in pictures at least as well as the real thing, if not a little better. It would seem to the man who has not tried it that if any goods can be handled easily and well by sample, woven fabrics of various sorts and the garments made from them would be the goods. But the entering wedge has been driven, and the idea has taken hold on the textile trade, all because the thing has been tried and has been found immensely practical from every possible standpoint. It is true that so far as fabrics themselves are concerned it is easy enough to carry samples, because samples can be made as small as desired; but the difficulty and the woes of the travelling salesman lie in the fact that the enterprising manufacturer gets out a wide variety of models; and that is the answer.

Naturally, it is necessary, in order to show the line of goods to prospective customers, to have at least one of each model made; and as the number of different models multiplies, so multiplies the weight of the salesman's trunks, and the labour of going through them, and the time taken from the merchant in looking over the line. It seemed unavoidable, however, until some manufacturer—one in a western city—discovered the use of photography, or a photographer discovered him, it doesn't particularly matter which. At any rate, this was about the process of reasoning, and it might have been used by either the manufacturer or the photographer: "All that the merchant wishes to know about the fabrics which we use in making up our goods is their quality—whether they are of wool or cotton, how finished, and so forth. When he has satisfied himself on that point he is through as far as fabrics are concerned. Of course, he wishes to see how our various models look, which is the reason why we have been hampering our salesmen with ten or a dozen trunks; but is there any reason on earth why the models cannot be shown as well, if not better, by photographs? None, apparently; it is certainly worth trying, at any rate."

And it was tried, and, as a matter of actual fact, it developed that as far as showing the models was concerned the photographs had a distinct advantage over the old-fashioned method of carrying the mass, or mess, of samples in this, that in nearly all cases photographs could be taken not only of the garment itself but of a living model wearing the garment; whereas there is hardly anything less attractive than a limp and crushed garment dragged from a sample case and spread over a counter or a chair. And while a model on the spot would doubtless be better, there are insuperable practical difficulties in the way of carrying or procuring afresh in each town a complete staff of suitable models for a good-sized line.

A happy combination of the old and the new system was, therefore, decided upon by the aforementioned manufacturer, who handled a wide variety of lines. By the liberal use of the services of the fortunate commercial photographer who handled his business he covered his entire line, as far as models went, completely, with a separate photograph of each standing alone and upon a model. Where colours were important he had the photographs delicately hand-coloured, making them as lifelike as the thing itself.

Looking over this set of photographs, which were bound into neat books, each line having its own volume, he was enthusiastically satisfied that as far as models were concerned he had the situation covered. Turning his attention then to the necessity of showing fabrics and finishes, he met this need by the use of swatches of the fabrics used in each line—books of samples, as they might be called—supplemented by a few samples, a mere fraction of the number once carried. And the whole outfit, which was really infinitely more satisfactory from every business consideration than the old one, was much smaller and very much easier to handle.

This manufacturer, as stated, handled a number of different lines, any one of which might be turned out exclusively by a single factory. The method of handling them in connection with the photographs referred to might, therefore, be interesting. It was as follows:—

Suspenders.—About 150 samples, weighing 60 lbs. or more, were formerly carried by each man. Now a book of leaves on which a short section of the web and the ends and mountings are shown enables the display of the line to much better advantage, both as to effect and to time

Blouses.—These formerly required a separate trunk; to-day, by the use of photographs and a half dozen actual garments, a 24-lb. package takes care of the line much more satisfactorily.

Underwear.—This line also required an entire trunk to itself. Photographs of living models, with a few samples, now give a much better idea of the line than formerly.

Sweaters, neckwear, dress shirts, wash goods, house dresses, children's dresses, and boys' wash suits are among the other lines covered in this way; and while some of them do not lend themselves as fully to the use of photographs as others, all have been handled with vastly less labour, both by salesmen and by retailers looking over them, than under the old way. And the efficiency of the photograph-plus-sample method of showing this particular class of goods is indicated by the fact that the manufacturer in question has noted a marked increase in his business since installing the new system for his travelling force, and naturally he is delighted.

The saving in wear and tear on the samples themselves is a very considerable item to the jobber who handles a number of different lines. The photographs are relatively inexpensive, whereas the samples in many cases cost a good deal, and as they have to be sold after use on the road at reduced rates the actual economy in money saved is easy to understand.

Another item worth considering, too, is that by cutting down the number of trunks and the weight of those carried the rather heavy expense of excess baggage is considerably reduced. The concern which adopted the use of photographs managed to reduce the number of trunks handled by its force by not less than 300, making a total of 7,200 lbs. of excess baggage entirely eliminated.

"The conservation of the salesmen's time is one of the greatest benefits," declared the jobber. "It is no small task to pack and unpack a dozen or more trunks once or twice a day. Frequently our salesmen each carried 1,700 lbs. of samples in the general line, and to handle these required much time and no little strength. To inspect them, moreover, a merchant had to visit the sample room in the evening, after a hard day in the store, and the result

was that he bought hurriedly. He wanted to get the disagreeable job finished as soon as possible, and did so. The salesman was tired, too; and it is only natural to lose enthusiasm as one loses energy.

"With our new system the men are carrying only about half the number of trunks formerly taken out, and selling more goods from the photographs than they ever did from samples. They are covering more territory, and average at least one town more a week; and, best of all, they are not tired out with handling a ton or so of samples daily, and are thus able to do their work much better."

In fact, the use of photographs in showing almost all lines of fabrics on the road has fully justified itself. The answer is obvious to the photographer with the desire and the ability to handle this kind of business. To paraphrase the famous advertising slogan used by a famous manufacturer of photographic equipment, not to mention that of an almost equally well-known soap-maker, "Is there a dry goods jobber in your town?" If there is he ought to be your "meat."

G. D. CRAIN, JUN.

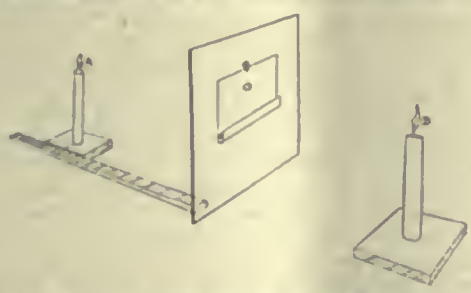
THE COMPARISON OF THE DENSITY OF NEGATIVES.

THE following method of comparing the density of negatives is devised to obviate the necessity of trial exposures in enlarging or contact printing by artificial light, and also to remove the element of conjecture as to the number of "tints" required in carbon work. Taking a negative of medium density as a standard, the relative density of any other negative can be obtained in a few seconds and recorded for reference.

The principle utilised is that of the Bunsen grease-spot photometer, familiar to physicists, and the apparatus is consequently simple and inexpensive. It consists, in fact, of two candles supported on square pieces of wood, a paper screen, and a graduated straight-edge, as illustrated in the diagram. The screen is constructed by cutting in a piece of stout card an opening slightly smaller than the negatives to be compared. A piece of paper, previously dampened, is mounted across the opening by means of a margin of glue applied to the card. When this is left to dry the paper will be found to be drum-taut. A rebated ledge, composed of two superimposed strips of card, is next affixed to the card on the paper side, so that the negative may be supported with the film side flush against the paper screen. With the base of the plate so held, any form of clip will suffice to hold the top in position.

The following mode of procedure was adopted to compare a number of negatives (¼-plate). The screen (C) was set up vertically, with the candles (A and B) on either side, so that the points of light and the centre of the negative were in a straight line. The candle (B), on the negative side of the screen, was maintained at a constant distance of 10 ins. from the screen, while the candle (A) was free to move along the graduated straight-edge.

The negative selected to act as the standard was then inserted with its film side against the paper, and other lighting in the room was extinguished. Observing the paper side of the screen, and



shielding the eyes from the glare of the candle (A) by means of a card, this candle was moved from a distance towards (C). The shadow of the negative cast by the candle (B) on the screen became fainter and fainter until it finally disappeared. At this point the distance between (A) and (C) was measured along the graduated scale.

Negatives to be compared were then tested similarly, and a value for AC ascribed to each.

The standard negative was then printed on bromide paper to give a satisfactory print, the printing being carried out at a distance of 2 ft. from a batswing burner. The necessary exposure for the other negatives was then obtained by employing the following calculation:—

Let "S" equal distance AC for standard negative,
"D" equal distance AC for compared negative,
"t" equal exposure for standard negative, and
"x" equal exposure it is required to find.

$$\text{Then } \frac{x}{t} = \frac{D^2}{S^2}$$

$$i.e.,\ x = \frac{t}{S^2} \times D^2$$

Now the value of $\frac{t}{S^2}$, having once been found, is a constant for all cases, and becomes a factor by which we multiply the value of AC^2 for any given negative in order to arrive at the comparative exposure for that negative.

The standard negative taken required 15 secs. The value of AC for the standard negative was 8.4 ins. The factor is therefore as follows:—

$$\frac{t}{S^2} = \frac{15}{70{\cdot}56} = {\cdot}21$$

Some widely varying examples were taken, and the results tabulated thus:—

Negative.	AC	AC^2	$AC^2 \times {\cdot}21$
Standard	8·4	70·56	15·0 secs.
1	7·4	54·76	11·5 secs.
2	22·4	501·76	105·4 secs.
3	7·0	49·00	10·3 secs.
4	6·0	36·00	7·6 secs.
5	18·5	342·25	72·0 secs.

In the case of excessively contrasty negatives it is best to content oneself with the disappearance of the portions of the negative in which it is desired to obtain most detail; and it is realised that this method takes little account of stained gelatine. At the same time it is claimed that it possesses advantages over pure guesswork, is simple in operation, and quicker than the method of trial exposure and development.

HENRY W. G. BIDGOOD

THE CITY AND GUILDS EXAMINATIONS IN PHOTOGRAPHY.

THE programme of the examinations to be held next year by the City and Guilds of London Institute deals with photography amongst other technological subjects. As in recent years, the acting examiners for 1919-20 are Mr. H. Chapman Jones and Mr. Charles W. Gamble. An important change, however, has been made in the examinations held in England and Wales: presumably it does not apply to Scotland and Ireland. This change, so far as it relates to England and Wales, appears to have been made somewhat hurriedly, since the announcement of it appears in the "Programme" as a special inset, printed in red ink, whilst reference to it is not discoverable elsewhere in the manual. The change consists in the abandonment of Grade I. of the examination, both in pure photography and photo-mechanical processes. It appears that this decision has been come to in agreement with the Board of Education, and is the result of the opinion of the latter Board that examinations held by outside bodies or institutions have the tendency to interfere with the satisfactory working of the system of instruction in grouped courses of allied subjects. The City and Guilds of London Institute, which for many years past has done most valuable work in encouraging the systematic study of technological subjects by its series of examinations, has therefore agreed to discontinue, in England and Wales, examinations in Grade I. of the various subjects, and in Grades I. and II. in the case of subjects where the examination is held in three grades.

While we have never been pledged to the view that the examination as a test of efficiency or an encouragement of study is the best for the purpose, yet during the many decades in this country when technological training was shamefully neglected by the Government, the examinations held by the City and Guilds of London Institute

provided an incentive to study, and benefited the progress of numerous arts and crafts to a degree which must always be borne in remembrance to the credit of the Institute. At present we do not know what form of examination or test is to be substituted for Grade I. City and Guilds examinations which are now being withdrawn, but it still seems of service to draw to the notice of the many more serious students who are to be found in the ranks both of photographic assistants and amateur photographers, the programme of study which is, or rather has been, prescribed by the City and Guilds of London Institute for more elementary students. It is even necessary to do this, for the reason that in the advanced or Grade II. examination the student is expected to have a wider and more understanding knowledge of the matters in the syllabus of Grade I. We may, therefore, quote from the "Programme" of the Institute the particulars of both grades—of Section A, pure photography; and Section B, photo-mechanical processes.

PURE PHOTOGRAPHY.—GRADE I., SECTION A.

The examination will include questions on such subjects as the following:—

1. The elements of photographic optics. The photographic camera and its adjuncts, lenses, diaphragms, shutters, shades, etc.

2. The practice and theory of the gelatine dry-plate process, including the use of colour sensitised plates, lantern-slide making, copying and enlarging, but exclusive of emulsion making; the composition of and defects in gelatine dry plates; the defects of gelatine negatives and transparencies, their causes and remedies.

3. Various methods of developing, fixing, intensifying, and reducing negatives, with a general knowledge of the chemicals employed.

4. Silver printing by print-out processes, including vignetting and printing in clouds, toning, and fixing; printing on gelatino-bromide and "gas-light" paper; platinotype printing.

5. Spotting and mounting prints

6. The studio, dark-room, and printing department, and their requirements. Lighting of the object to be photographed.

PHOTO-MECHANICAL PROCESSES.—GRADE I., SECTION B.

The examination will include questions founded on the following subjects:—

The apparatus used for negative making both in the studio and in the dark-room. The elementary principles of negative making—the formation of images by means of lenses, the action of light upon sensitive surfaces, development, and fixation. Practical details of importance in the manipulation of the wet collodion, collodion emulsion, and gelatino-bromide processes.

A simple knowledge of the properties of proteid substances as used in photo-mechanical photography—albumen, gelatine, gelatose (fish glue and the like), and their behaviour towards reagents. The chromates and bichromates, and the preparation of sensitive media.

The principles and practice (in so far as relates to essentials) of the following:—

The production of a relief block in line and half-tone, and the direct and transfer processes of photo-lithography.

PURE PHOTOGRAPHY.—GRADE II., SECTION A

Written Examination.—Candidates will be expected to answer more difficult questions in the subjects of Grade I., and, in addition, a knowledge will be required of:—

1. The history of photography, with a general knowledge of obsolete processes (including the collodion processes).

2. The theories of the photographic image, of development, fixing, intensification, and reduction.

3. The theory of light as applied to photography, including a general knowledge of spectrum and orthochromatic photography.

4. The principles of photographic optics.

5. The theory and practical use of sensitometers for testing the speed and gradation of plates; and also their uses in printing processes.

6. The principles and practice of the preparation and use of gelatine emulsions.

7. The use of artificial light. Telephotography. Photomicrography.

8. Carbon printing; methods of printing with bichromates and with iron salts; enamels.

9. The theory and practice of colour-photography.

10. The application of photography to scientific and technical purposes.

Practical Examination.—Candidates will be required to show proficiency in conducting any of the following practical operations:—

1. Finding the focal length and aperture of a lens. Examining a lens as to its aberrations by simple methods, and its suitability for various photographic purposes.

2. Testing the sensitiveness and gradation of photographic materials.

3. Copying a drawing, engraving, transparency, etc.

4. Making enlargements from a quarter-plate negative.

5. Reducing and intensifying photographic images.

6. Printing, toning, developing, fixing, and mounting prints by any of the current processes (including silver, platinum, and carbon).

7. Making a lantern-slide by contact or in the camera.

8. Orthochromatic photography.

9. Colour photography by screen-plate processes.

10. Testing coloured materials as to their fitness in connection with the illumination of the dark-room. Testing colour screens for other purposes.

The care, cleanliness, and neatness with which candidates execute their work will be taken into account in the award of marks.

Specimen Work.—Candidates will also be required to forward, so as to reach the offices of the Department not later than April 26, 1920, not fewer than three or more than six negatives, not less than quarter-plate size nor more than whole-plate, together with mounted prints made from each of them by any ordinary photographic printing process or processes that the candidate may select. The negatives and prints must be accompanied by a statutory declaration made by the candidate to the effect that the selection of the subjects and the whole of the work (except the manufacture of the plates, sensitive paper, and mounts) involved in the production of the negatives and prints has been done by the candidate without assistance from any other person and within the twelve months preceding the date of the examination. Forms for the declaration may be had on application.

PHOTO-MECHANICAL PROCESSES.—GRADE II., SECTION B.

Written Examination.—Candidates will be expected to answer questions of a more advanced nature in the subjects of Grade I., in addition to the following:—

The principles underlying the photographic rendering of colour. The correct translation of colour into monochrome. The different methods which are employed in photo-mechanical processes for the rendering of gradations of light and shade. The principles and practice (in so far as relates to essentials) of the following processes:—

1. The production of three-colour blocks by the type-high process. 2. Photogravure. 3. Collotype.

Candidates are reminded that in the written papers more value will be attached to answers which show a knowledge of the essential principles involved than to lengthy details of a merely manipulative nature. They are urged, therefore, to pay special attention to the theoretical parts of the subject. They must also understand that the practical test is a very important part of the examination.

Practical Examination.—The candidate will be required to show proficiency in practical operations in *one* of the above processes, numbered (1), (2), (3), including the preparation of negatives suitable for the class of work chosen; or, in lieu thereof, he may select (4) negative making alone, in which case he must be prepared to take tests in any *two* of the following groups:—(*a*) continuous tone negatives from pictures in colour, (*b*) continuous tone negatives from drawings in monochrome and photographs, (*c*) continuous tone negatives from objects in relief, (*d*) broken tone (screen) negatives from monochrome originals such as wash drawings or photographs, (*e*) line negatives from originals in line, such as pen and ink drawings, wood engravings, plans or tracings. Notice must be given to the local secretary as to the test which the candidate will take at the time of his application for examination.

SPEAKING FILMS.—According to a Reuter report from Stockholm, a Swedish engineer named Berglund claims to have solved the problem of the so-called "speaking film," having obtained by a method of photography the absolute synchronisation of movement and sound. The invention has already been demonstrated to a number of Press representatives, who were most enthusiastic in their comments.

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Applications October 13 to 18:—

CAMERAS.—No. 24,973. Film photographic cameras. A. W. Dodds.

FILM ADAPTER.—No. 25,384. Adapter for adapting roll-films for cameras. J. P. Dukinfield.

COLOUR PHOTOGRAPHY.—No. 25,208. Colour photography. Natural Colour Pictures Co.

PROJECTION SCREENS.—No. 25,490. Manufacture of cinematograph, etc., screens. W. L. Bemrose and J. W. Verity.

CINEMATOGRAPHY.—No. 25,571. Film trap or gate of cinematographs. J. Ballantine.

CINEMATOGRAPHY.—No. 25,150. Renovating cinematograph films. W. F. M. Edwards.

CINEMATOGRAPHY.—No. 25,016. Apparatus for producing halo, scintillating, and prismatic colour effects in cinematography. T. F. Gaynor.

CINEMATOGRAPHY.—No. 25,080. Method of attaching sprockets, gears and wheels of cinematograph projectors. H. E. Hartley.

COLOUR CINEMATOGRAPHY.—No. 24,962. Apparatus for production of coloured cinematograph films. S. de Prokudine-Gorsky.

COMPLETE SPECIFICATIONS ACCEPTED.

These specifications are obtainable, price 6d. each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

TRANSPARENT SENSITIVE EMULSION.—No. 132,846 (Sept. 18, 1918). The invention relates chiefly to an improved manufacture of photographic material which is transparent as well as sensitive. This is attained by augmenting the quantity of gelatine to an exceedingly high degree and diminishing the quantity of silver halide (such as silver bromide) in an ordinary photographic plate in which the compound is the only light-sensitive substance.

As an experiment in a laboratory the following method can be used. A silver bromide plate of 9 by 12 cm. is placed in water so that the gelatine is soaked, and the emulsion is scraped off and dissolved in a water bath. To this small quantity of emulsion is added 40 cc. of a 6 per cent. solution of gelatine at, for instance, 40—50° C., and the mixture is well shaken. 20 to 30 plates of 9 by 12 cm. can be thinly coated by the emulsion produced from this one plate, which plates are sensitive and perfectly transparent even if several such plates are superposed.

When such a plate is exposed in a camera, a negative which is exceedingly thin and quite unfit for ordinary printing is obtained after development and fixing; but from such a negative a picture can be produced by copying. For instance, these plates can be intensified by known methods thereby obtaining a denser covering; but the best result is obtained by transforming the silver into a colouring matter absorbing compound and subsequently soaking the plate in a solution of an appropriate dyeing substance. Such a dye-absorbing substance is—as is well known—silver iodide; but it has been proved that silver sulphocyanide and colourless cuprous salts (cuprous iodide and cuprous sulphocyanide) are suitable for this purpose.

Some solutions for producing intensely coloured pictures from weak silver pictures are given below by way of example.

10 per cent. solution of potassium citrate...	40 c.c.s.
20 per cent. solution of cupric sulphate	15 c.c.s.
10 per cent. solution of potassium thiocarbamide	15 c.c.s.
Acetic acid	2 c.c.s.

After bleaching in this solution the plate is washed and is then dyed in basic dyes or certain acid-dyes (Saürerhodamin, Echtgrün, etc.), whereafter the plate is again washed until the non-fixed dye has been washed out.

The plate may also be bleached in the known manner by cupric sulphate and potassium bromide, whereby the silver is replaced by silver bromide and cuprous bromide. These compounds do not strongly absorb colour substance, but if the plate is afterwards treated with a solution composed of

Water	30 c.c.s.
10 per cent. solution of potassium citrate ...	20 c.c.s.
20 per cent. solution of potassium iodide ...	20 c.c.s.

in which is dissolved a little dyeing substance, for instance rhodamine, the plate is cleared and at the same time the dyeing substance is bound in the places previously occupied by silver bromide and cuprous sulphocyanide.

In the above example the potassium citrate may be replaced by other substances which have a hardening influence on the gelatine.

The above-described plate with silver bromide and cuprous bromide, or a plate with silver bromide only, may also be treated with a solution the essential compound of which is thiocarbamide, whereby dye-absorbing substances are produced. For instance, cuprous iodide may be dissolved in thiocarbamide and the plate be treated with this solution; or the following solution can be used which is especially adapted for the treatment when the film contains silver bromide or some other silver halide:—

Water	75 c.c.s.
5 per cent. solution of potassium metabisulphite	25 c.c.s.
4 per cent. solution of thiocarbamide	25 c.c.s.
20 per cent. solution of potassium iodide ...	10 c.c.s.
10 per cent. potassium sulphocyanide.....	25 c.c.s.

After treatment with one of the thiocarbamide-containing solutions the picture is dyed and washed out.

In any of these ways an intensely coloured picture is obtained which in the ordinary manner can be used for copying or which can form one of the three pictures in three-colour photography. The photographic films being more transparent, such films may be superposed during the photographing, and in this way all the negatives can be illuminated together without perceptible loss of sharpness.

In producing two-colour pictures according to this method the two differently sensitised photographic films may be arranged one on each side of the same film.

In producing three-colour pictures one film may be on celluloid, glass or the like and used in connection with the above-named double film.

Between and in front of the various films suitable screens can be arranged if necessary.

It has been proposed to add from 5 to 10 per cent. of silver bromide emulsion to the bichromated mucilages used for surfacing photographic plates and the like, to colour the almost invisible undeveloped image on such plates by means of dyes, the silver bromide being removed by a suitable solvent, and to use coloured positives produced in this manner for the three-colour process of producing coloured photographs.

It has also been proposed in sulphide-toning photographic silver prints to convert the silver salt into a halide by means of an alkaline solution containing potassium ferricyanide, potassium bromide, and thio-urea or a homologue thereof.—Jens Herman Christensen, Gollerod, Holte, Denmark.

Trade Names and Marks.

APPLICATIONS FOR REGISTRATION.

NILTONA.—No. 384,284. Photographic sensitised paper. Paget Prize Plate Co., Limited, 132, St. Albans Road, Watford; photographic plate and paper manufacturers. July 12, 1918.

LUXURIA.—No. 384,285.—Photographic sensitised paper. Paget Prize Plate Co., Limited, 132, St. Albans Road, Watford; photographic plate and paper manufacturers. July 12, 1918.

KRUPPS TO MAKE CAMERAS.—According to the "Daily Mail's" Berlin correspondent, the "Deutsche Allgemeine Zeitung" reports from Essen that the firm of Krupp will convert part of their great munition factory to the production of photographic apparatus, having reached an agreement with the Dresden firm of Ernemann.

Analecta.

Extracts from our weekly and monthly contemporaries.

The Lens and Straight Pictorial Photography.

Why I advocate (writes "Flambeau" in the "Photographic Journal of America") only straight methods is that I am anxious to see photography attain an unquestioned place among the arts. This has been denied to her in most quarters, and only grudgingly accorded her in others. It looks to me that unless photography—which is painting by light—is done entirely with a lens, and if brush-work is resorted to instead, or in part, the sponsors for that deviation are furnishing their opponents with all the reason they require to win their case. For where lens-work ends photography ends as an art (except for the chemical treatment necessary to develop the image and print, both impressed by light), and where other media are used to help out there is a confession of artistic failure in photography. With a soft-focus lens, in hands educated to its use, the entire work can be done by pure, straight, unaided photography, and so easily and well as to convince almost every unprejudiced person that she has attained to artistic rank of no mean order and cannot be displaced.

New Books.

Rare Books.—The catalogues of rare books on the various branches of science and technology which are issued by Messrs. Henry Sotheran and Co., 140, Strand, London, W.C.2, are rightly appreciated by bookmen and bibliophiles for their detailed specification of volumes which are long out of print as well as for the very admirable classification and alphabetical arrangement of their contents. The list, No. 773, just issued, price 2s. 6d., is a volume of over 250 pages, which will repay the study of anyone interested in past technical and scientific literature. Photography, which is included in chemical technology, figures in the list only to a small extent, but Messrs. Sotheran have two copies of the work by Charles Louis Chevalier on cameras issued in 1829, and of great photographic interest through the association of Chevalier and Daguerre. They have also a copy of the "Guide du Photographe" by the same author, issued in 1854, and containing much information on the work of Niépce and Daguerre, and on the photographic processes which had come into use among French experimenters up to that date. The compilers of the catalogue do not spare criticism of photo-mechanical methods of reproduction in their comment upon the early work of Sampson on the making of engraved blocks. They say: "From it sprang in time the whole fell tribe of process blocks, which have starved out a beautiful art, set New Grubb Street writing up to blocks, and made each new and pushful publisher a terror to the tasteful."

The Condensed Chemical Dictionary.—A reference work on the chemical substances, natural and manufactured, which are commercially sold is newly issued by the Chemical Catalogue Company, 1, Madison Avenue, New York, price five dollars. It is a dictionary of chemicals, each entry in which states in a very readable form the chief properties and other particulars of commercial or technical interest. The compilation has been made with the aim of providing merchants, shippers, and dealers, rather than technical or scientific chemists, with information which is constantly being wanted in reference to chemical products. Thus each entry first states the colour and other physical appearance of the substance. Then follow data of such constants as specific gravity, melting point, and boiling point. A qualitative indication is given of solubility in water, alcohol, and ether. Brief particulars are stated as to the method of manufacture and the commercial grades in which the product is supplied. The entry further specifies the description of container in which the product can be packed, the chief uses to which it is put, and, lastly, gives similarly brief notes on the classification of the substance by fire-insurance companies, and on the shipping regulations applied to it by railway companies in the United States. A specimen entry will show the mode of treatment thus applied to each chemical:—

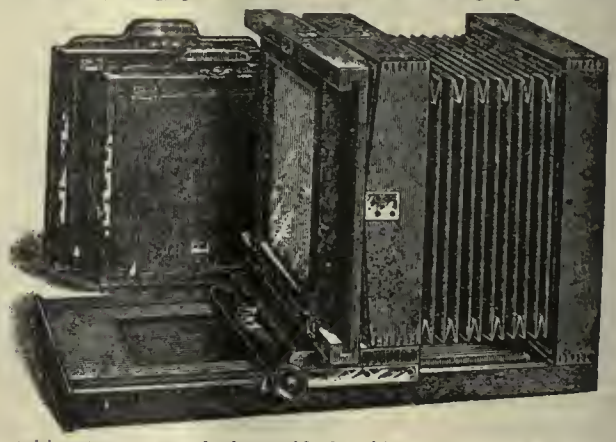
Sodium Sulphite: (a) Na_2SO_3; (b) $Na_2SO_3 7H_2O$.
Colour and properties: White crystals or powder; saline, sulphurous taste.
Constants: Specific gravity, 2.6334; (b) 1.5939; melting point, (a) 150 degs. C.; (b) loses $7H_2O$ at 150 degs. C.; boiling point, (a) decomposes; (b) decomposes.
Soluble in water; insoluble in alcohol.
Derivation: Large sodium carbonate crystals are placed in a lead-lined vat on a perforated false bottom, a current of sulphur dioxide is passed up through the crystals; a solution of so-called sodium di-sulphite collects in the bottom of the vat. This is saturated with sodium carbonate, concentrated, and allowed to crystallise.
Method of purification: Recrystallisation.
Impurities: Heavy metals; arsenic.
Grades: Pure, crystal, or dried; reagent, crystal or dried; commercial and B.P.
Containers: Wooden kegs.
Uses: Photography; preservative; antiseptic; reducing agent; medicine.
Fire hazard: None.
Railroad shipping regulations: None.

From this example it will be seen that the information in the volume is of a kind which is not readily ascertainable from the usual chemical dictionaries or text-books, or, at any rate, is discoverable in these latter only with a good deal more trouble than in a compilation such as the present one. The volume is certainly a most valuable addition to technical and commercial chemical literature.

New Apparatus, &c.

The Salex Studio Camera. Sold by the City Sale and Exchange, 81, Aldersgate Street, London, E.C.1.

One of these studio cameras, which are obtainable through any of the branches of the City Sale and Exchange, has been sent to us for our examination and review. Although moderately priced, the apparatus embodies the full range of movements which are of service in studio portraiture. In the half-plate model, which is the size we have inspected, the extension available from focussing screen to lens panel is 28 inches. There is double-swing movement of the back, each movement being separately controlled by milled set screws, and the front is provided with ample rise and fall, and with a lens panel 5 x 6 inches, sufficing to accommodate a portrait objective of ample focal length. The camera back is fitted with hinged focussing screen, and with detachable masks for postcard and panel (2½ x 3½) portraits. There are two single plate-holders,



one taking two postcard plates side by side and two panel portraits on a postcard, and the other fitted with carriers of postcard, 5 x 4, and quarter-plate sizes, and for the making of three panel portraits on a postcard plate. Both camera and plate-holders are very solidly and substantially made in dull satin-finish polished mahogany, presenting a very handsome appearance. In the half-plate size the price of the outfit, including two plate-holders, is £12. The postcard outfit is supplied at the same price, whilst in whole-plate size the outfit costs £15. Single plate-holders, in any of these three sizes, £1 17s. 6d. each. The outfit is certainly one which can be recommended to the beginner in studio portraiture who must limit his expenditure yet does not wish to buy a camera which is deficient in essential working features.

CATALOGUES AND TRADE NOTICES.

THE LANTERN SEASON.—Messrs. W. Butcher and Sons, Camera House, Farringdon Avenue, London, E.C.4, have just issued a 96-page price-list descriptive of their many specialities for the winter season. These are chiefly optical lanterns and accessories for these latter in the shape of arc lamps, projection screens, and lantern slides, but the list includes also the Butcher series of enlarging apparatus, and further devotes a number of pages to the sets of model engineering parts, now so popular as an educational toy for boys, and supplied by Messrs. Butcher in great variety.

CITY SALE LANTERN SLIDES.—The City Sale and Exchange, 81, Aldersgate Street, London, E.C., sends us a 68-page catalogue of lantern slides, which are available for hire at odd times or regularly, according to a subscription system. In connection with this latter the firm makes a special offer to lend customers subscribing for the hire of 1,000 or more slides a lantern which is returnable at the end of the season. Deposit is paid on the lantern, and the amount is returnable, less a moderate deduction, when the lantern is returned immediately after Easter next. Particulars of this offer are obtainable in a circular just issued by the City Sale and Exchange.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

MONDAY, NOVEMBER 3.

South London Photographic Society. "Apparatus and its Use." W. J Shields.
Dewsbury Photographic Society. "Printing Processes." A. Dordan Pyke.
Willesden Photographic Society. "The Domestic Fly; Life History, Structure, and its Menace to Health." Dr. G. H. Rodman
Manchester Amateur Photographic Society. Print and slide entries for the Annual Exhibition.
Bradford Photographic Society. "A Journey to Mexico and the Far West." L. Whitehead.

TUESDAY, NOVEMBER 4.

Royal Photographic Society. "Demonstration of Raydex." F. R. Newens.
Hackney Photographic Society. Prints and Slides from 1919 Outings.
Chelsea Photographic Society. "Bromoil." G. B. Clifton.

WEDNESDAY, NOVEMBER 5.

Royal Photographic Society. "The Marshall Islands." T. J. McMahon.
Croydon Camera Club. The Annual Club Dinner.
North Middlesex Photographic Society. "Colour Plates." F. P. Bayne. Outing Print Competition—South Mimms.
Edinburgh Photographic Society. General Meeting. "X-Rays and X-Ray Photography" Dr. Hope Fowler, F.R.C.P.E.
Dennistoun Amateur Photographic Association. "Transferotype Demonstration." W. W. Weir.
Partick Camera Club. Whist Drive.
South Suburban Photographic Society. "Lantern-Slide Making." H. D. Fretwell.

THURSDAY, NOVEMBER 6.

Liverpool Amateur Photographic Association. "Local Prehistoric and Old Wrought Stonework." J. O. Creswell.
The Camera Club. "Wild Life in the Tree Tops." Capt. C. W. R. Knight.
Richmond Camera Club. "A Further Chat on Pictorial Photography." S. Bridges.
Brighouse Photographic and Naturalist Society. Lecturettes by Members.
Aston Photographic Society. "Toning." A. E. Withers.
Wimbledon Camera Club. "The Negative." W. F. Slater.
Hull Photographic Society. "A Holiday in Hull and Oxford." J. V. Saunders.

FRIDAY, NOVEMBER 7.

Royal Photographic Society. "Some Things Seen in Holland." W. Rawlings.
Dennistoun Amateur Photographic Association. "Plates and Exposure." D. M'Millan.

THE PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

A MEETING of the Council was held at 35, Russell Square, on Thursday, October 23, 1919. Present: Angus Basil, Gordon Chase, Alex Corbett, Alfred Ellis, S. H. Fry, W. E. Gray, Reginald Haines, Geo. Hana, Lang Sims, H. St. George, R. N. Speaight (London members), and Marcus Adams (Reading). Letters of regret for non-attendance were read from W. Illingworth (Northampton) and Tom Chidley (Chester).

The report of the Finance Committee was received, and its recommendation to continue the present Honorary Secretary as paid Secretary for the year ending December 31, 1920, was adopted unanimously. The Hon. Secretary was instructed to write to the gentlemen who had answered the Council's advertisement.

After discussion the Hon. Secretary was instructed to call a meeting of the Finance Committee to precede each Council meeting by half an hour.

The Hon. Secretary informed the Council that he had received notice from a member, Mr. Robert H. Rice, of Walthamstow, that he had lodged a complaint of the price of bromide postcards with the Holborn Local Profiteering Committee. He had also lodged a similar complaint with the Cheshunt Urban Council as he was not sure whether he should proceed in his own district or in that of the business firm against whom the complaint was made. The complaint was worded as follows:—

To the Holborn Council Profiteering Tribunal.

Dear Sirs,—I am enclosing a quotation from Messrs. Houghtons, Ltd., of 88-89, High Holborn, W.C., photographic apparatus manufacturers and sundriesmen, for 20,000 bromide postcards at 65s. per 1,000, the ruling price in 1914 being 16s. per 1,000; this, in my opinion, being a flagrant breach of the Act, in so far as the price of bromide papers (which is substantively the same) has only been increased 75 per cent., viz., a gross of bromide paper 4¼ in. x 6 in., costing in 1914 10s., as against 17s. 3d. for the same now.

Yours faithfully,

(Signed) ROBERT H. RICE.

P.S.—Not being sure of the proper procedure, I have also lodged a similar complaint with the Cheshunt Urban District Council Profiteering Tribunal.

After discussion the Council resolved unanimously to give Mr. Rice the full support of the Association, and instructed the Hon. Secretary to write him to that effect.

Mr. Corbett stated that he believed the Belgian and French manufacturers were acting in strict accord with English manufacturers in this "price" matter.

Mr. Arthur Brooks having reported that the preliminary arrangements for the holding of a photographic fair at the Horticultural Hall in April, 1920, were now completed, it was unanimously resolved that the Council hold a Congress in 1920.

A member having complained of the bad quality of dry-mounting tissue supplied by a London firm, and several members of the Council stating that they had also been supplied with unsatisfactory material from the same source, and the firm in question having refused either to exchange the defective material, or to return the price paid, the Council approved the Hon. Secretary's action in placing the matter in the hands of the Association's solicitor for legal process.

The next meeting of the Council will be held on Friday, November 14, at 6 p.m. (Finance Committee at 5.30).

ROYAL PHOTOGRAPHIC SOCIETY.

MEETING held Tuesday, October 28, Mr. T. H. B. Scott in the chair.

Mr. A. H. Blake delivered a lecture, with lantern illustrations, on "The King's Highway," a discourse on the evolution of roads in England from the earliest times. Mr. Blake pointed to the traces still remaining of the roads used by the early Britons, which were generally to be found along the sides of the hills and of which a good example could be traced between Lewes and Brighton. He passed to consider the roads made by the Romans, illustrating his remarks by photographs of the Watling Street and other examples of the highways constructed by the Romans. Coming to a later period, he dealt with the life of the road in the pedestrian time of the Canterbury Pilgrimages, illustrating the scenes of that age by reproductions of old drawings. The growth of wheeled vehicles on the roadways and the development of this form of locomotion to its culminating point in the stage coach services were followed in a series of interesting pictures. The desertion of the road caused by the development of railway lines represented a gap in Mr. Blake's subject, but in his discourse he came at last to the re-discovery of travel by road through the introduction of the motor-car. The lecture, in its blend of old and new, greatly interested a large audience, by whom a hearty vote of thanks was accorded to the lecturer.

CROYDON CAMERA CLUB.

Mr. A. DORDAN PYKE, representing Messrs. Johnson and Sons, gave a lecture on "The Art of Developing," essentially a lecture of real value to beginners, and avowedly intended for their benefit. It should also be added that the "trade" aspect was reduced to the minimum, too much so, perhaps, as all amateur photographers worthy of the name must naturally be keenly interested in the products of such a well-known firm as he represents. Mr. Pyke has a happy colloquial style, does not worry his audience with undue profundity, and last week, backed with a 20-oz. measure filled with pure cold water for sustenance, with the happiest smile in the world rushed

into the jaws of death by disposing of highly contentious points with a placid assurance one way or another, though warned in advance by the President (Mr. John Keane) that hoary-headed sinners were present on the look out for a cannibal repast.

The lecturer started by saying he had fairly got the wind up, for Croydon was one of the two last of a number of demonstrations recently given by him, and time after time he had been asked: "Have you appeared at Croydon?" and on the journey down disturbing recollections of these questions would persist in arising. It is quite impossible to follow him through his contribution, which naturally covered much old ground. Therefore only a few points can be alluded to. He started with the not unreasonable assumption that a camera and lens are necessary for the production of a negative of any sort, adding that perfect negatives were by no means easy to secure. Meters were very useful for determining the right exposure, but should never be allowed to become the master instead of the slave. There was no salvation in any particular plate or developer, and as regards the former, notwithstanding Mr. Sinclair's dictum to the contrary, he strongly advised the use of one of medium rapidity for all work, including snapshots, by the beginner. He advocated the system of development by time and temperature (Messrs. Johnson issue a very convenient chart giving the varying periods of development set against different temperatures), and exhibited a most workmanlike tank. On one occasion he had set out on a photographic trip armed with seven different makes of plates of medium speed, and all came up right in the tank. No white light should be allowed to reach the plate before it was fixed, though some had contended the contrary. For all-round use he strongly recommended the persulphate reducer. (Sensation.)

In the discussion Mr. A. F. Catherine was appalled, horror struck, and amazed at the recommendation of the persulphate reducer for beginners, which he had found most unreliable. In any case, it was the wrong reducer to employ with over-exposed negatives. "It was exclusively used in the R.A.F. Photo Section," said the lecturer. "And yet we won the war!" replied Mr. Catherine, looking more astounded than ever. Mr. J. M. Sellors shared the last speaker's opinion regarding the persulphate beast, and recommended the permanganate reducer. Mr. Vivian Jobling settled the point regarding white light being allowed to fall on the plate before fixation by saying he agreed with the lecturer. In such a case trouble might be met with in any attempt to intensify it. Mr. E. A. Salt followed at some length, regretting an hour was not at disposal to deal adequately with the contentious matter raised. The only really safe way to use the persulphate reducer was to make up a weak solution with hard water, and on the first signs of milkiness to withdraw the plate and wash for at least one minute. Any subsequent immersions in the reducer should be very short, and followed in each case by washing, with a final bath of sulphite of soda. Working in this way was slow but sure. In reference to some remarks made about the ferricyanide reducer and others having similar qualities, some correspondence had recently appeared in the "B.J." One important factor had, however, been overlooked, viz., the type of negative being dealt with. In the case of a fully exposed and developed negative, shadow detail might be composed of, and surrounded by, a very appreciable deposit of silver, permitting of a liberal application of a strong ferricyanide reducer. On the other hand, in the case of a negative with shadow detail set in clear gelatine, a similar application might mean its instant obliteration.

A most hearty vote of thanks was accorded Mr. Pyke for a capital lecture-demonstration. The very large audience showed the interest taken in the subject.

Ross Lenses.—Messrs. Ross, Ltd., inform us that it is with great reluctance that they have to announce an increase in the price of all their photographic lenses of 25 per cent., dating from November 1. This increase thus corresponds with one of 66.6 per cent. on pre-war prices. Messrs. Ross add that when the previous increase of 33.3 per cent. was made it was hoped that by means of mass production and an early reduction in the prices of material to avoid a further increase of price and ultimately to manufacture at a reasonable profit. These hopes, unfortunately, have not been realised. and the further increase has been dictated as a measure of absolute necessity.

Commercial & Legal Intelligence.

Legal Notices.—Notice is given that the partnership between William Davis and Joseph Willing, carrying on business as photographic agents at 173, Fleet Street, London, under the style of the General Art and Photographic Agency, has been dissolved by mutual consent. All debts due to and owing by the late firm will be received and paid by William Davis, who will continue to carry on the business in his own name or otherwise.

A receiving order has been made on a creditor's petition in the case of Richard Cardwell Barron, photographer, 7, Queen Street, Bloomsbury, W.C.1, and lately carrying on business at 19, Cheapside, E.C.2, and lately residing at Shedfield, Ashley Road, Thames Ditton, Surrey.

A supplemental dividend of 1s. 1¼d. in the £ has been made in the case of Arthur Aquila Noakes, photographer, residing and carrying on business at 17, St. Peter's Street, Canterbury, and lately carrying on business at 29a, St. Margaret's Street, Canterbury. The dividend is payable at the Official Receiver's Office, 68a, Castle Street, Canterbury.

NEW COMPANIES.

Clan, Ltd.—This private company was registered on October 20 with a capital of £500 in £1 shares. Objects: To carry on the business of manufacturers of, dealers in and agents for optical and photographic goods, etc. The subscribers (each with 250 shares) are: A. McConachie, 40, Milward Crescent, Hastings, pharmacist and chemist; Mrs. C. M. McConachie, 40, Milward Crescent, Hastings. The first directors are: A. McConachie (managing director and secretary) and Mrs. C. M. McConachie (both permanent). Registered office: 43, Plynlimmon Road, Hastings.

Correspondence.

**** Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

**** We do not undertake responsibility for the opinions expressed by our correspondents.*

FRADELLE AND YOUNG'S FLASHLIGHT PHOTOGRAPHY.

To the Editors.

Gentlemen,—Allow me to correct a statement in the article by "Practicus" in your issue of October 24, 1919. He says, "One of the best known flashlight workers, Mr. Fradelle, would never use explosive mixtures, etc." As a matter of fact, Mr. Fradelle was not a flashlight worker at all. I doubt if ever he made a dozen flashlight negatives in his whole career. It was his partner, Mr. Albert Young, who was the flashlight worker, and probably has taken more flashlight photographs than any man that has ever lived. I am in a position to know these facts as I was principal flashlight operator to the firm of Fradelle and Young for some considerable time, and Mr. Young and myself did all the operating.—Yours faithfully,

61, Biggin Street, Dover. Bertram T. Hewson.

A PHOTOGRAPHERS' CLUB FOR LIVERPOOL.

To the Editors.

Gentlemen,—Some time ago you were good enough to publish for me a letter on the above subject. While the responses were not numerous, it was gratifying to find that at least a few photographers take a live interest in their work and welfare. The club is still only a theory, but we are confident of ultimately achieving something.

In the meantime we are enjoying the social benefits of a local club —the Everton C.C.—which has offered membership to professionals. Any professional in or near Liverpool who can enjoy a good demonstration or a social evening should drop me a line, or communicate with the secretary, Mr. George Taylor, 11, Chapel Road, Anfield.

Letters from professionals outside Liverpool who are interested in the movement will also be welcomed by me. The Everton C.C. meets every Wednesday, at 8 p.m., at 14, Village Street.—Yours sincerely, J. Ronson Hall.

55, African Chambers, Oldhall Street, Liverpool, Oct. 27, 1919.

SENSITISING CANVAS.

To the Editors.

Gentlemen,—A reader having written to me through yourselves asking for a process similar to that described in my letter in the "B.J." of October 10, but giving a silvery grey tone, I may add a few notes.

The method given by me was worked out for canvas, and, as the sepia colour has always been deemed right for such work, no attempt has ever been made to alter it.

With regard to producing a silvery grey tone on canvas, the addition of a small quantity of a solution of gold chloride to the salting solution (calcium chloride in alcohol) will correct the sepia colour, and by following up the addition doubtless the desired grey may eventuate.

For producing grey tones on paper, first of all salt the paper in the following solution:—

Ordinary table salt	120 grs.
Gelatine	30 grs.
Water	20 ozs.

Soak the paper in this until thoroughly impregnated, then hang up to dry, and sensitise by brushing over with a 20-grain solution of silver nitrate acidified with nitric acid. Dry in the dark, or in a room lighted by ordinary artificial light. Print somewhat deeply under a thin negative, fix and tone in a diluted combined toning and fixing bath, following with immersion in a weak bath of plain hypo, 1 oz. to the pint.

Grey images may also be obtained on *bromide paper* from an average roll-film negative, exposing at least 3 ft. away from an ordinary incandescent light. "Old Photo."

THE ETERNAL QUESTION.

To the Editors.

Gentlemen,—Will you favour me with a space in your valuable columns to express to my brother workers my experience since my return to civilian life after four and a-half years' absence?

It is seven years since I wrote through your columns on the assistant question, but this time it will apply to the profession generally. On being demobilised I was eager to commence work, but my pre-war employer (like many others) had filled the vacancy through my volunteering in 1914. Looking through the "Vacant Situations" the outlook was very disappointing, because it appeared that the girl assistant had been brought on a level with the male assistant. The employers were inviting correspondence from "either sex." This brought to mind the pre-war methods of cheap labour, and it evidently still exists. I do not say women are not capable of doing the same as men, but there are certain departments in the profession in which they would look considerably out of place, besides being inefficient.

During the war the girls have had a splendid opportunity to secure an all-round experience (at our expense), and it appears that in future they will be keen competitors in the labour market.

All over the country you will see an increasing number of women opening businesses on their own. I am not against them showing their independence; but it will mean a great deal to their sisters in this respect—the trade will be over-crowded, and the man who, on his return, contemplated a business of his own and combining marriage with it, will find he will have to give up the idea of the latter or change his job. I am not suggesting that the man will be afraid of competition in work; far from it, from what I have seen of the exhibitions of some of their work; but there will not be the scope for so many photographers.

No one can dispute that girls can live more cheaply than men. Therefore they will be able to produce their work at lower prices, and also "offer" themselves at lower wages, thus throwing the men who left their situations to "defend their country and womenfolk" on the unemployment lists.

Regarding the "cut-throat" scheme that goes on in respect to the applications for a situation, take the advertisements in the vacancies, and you will scarcely find one employer who states what salary he is prepared to give. What is the result? Only this—that the hard-pushed fellows, just come back, are compelled to offer themselves cheap so as to secure a situation.

What is there against an employer stating the class of man he requires and the salary he is prepared to give? He can then choose a suitable man from his applicants by his specimens of work, etc.

Another point which will probably make some ashamed to be in such an underpaid profession. Take the average assistant or branch manager, who has put heart and soul into his work and studied it. What are his wages compared with a tram conductor who punches tickets? Fifty to sixty shillings is considered good for an assistant, and a slight commission for management, while the tramway men strike for sixty-five and get it. Don't forget, the tramway men are supplied with uniforms against the smart appearance the assistant is expected to keep up out of his "dibbs." Just look at the comparison between the two. One holds the great responsibility of dealing with penny tickets and has qualified himself so by "studying aritbmetic," with some nice joy-rides into the bargain, while the other has studied items too numerous to mention, and is subject to mental exertion whatever he does, and in addition the P.P.A. want him to pass examinations in the case of management. He has pounds to deal with and a small staff to supervise, with other responsibilities, yet, according to the profession, he is not worth any more than the ticket puncher. I will repeat what I said in my letter seven years ago—that so long as assistants are underpaid they will be tempted to make up for it through dishonesty.

One more important fact which ought to be remedied, the question of Sunday work. Very often you don't know you have this to do until you are engaged and arrive at your place. Such is my present case; so, brothers, beware! and make this inquiry before final settlement. Now, why, like everybody else, are we not paid double time for Sunday duty? One full day a week does not compensate for the one and a-half days you get in a Sunday-closing business, let alone the shamefulness of working on the Sabbath.

Excuse me for occupying so much space, but I hope this letter will not prove fruitless, and that some good improvement may be made in the profession.—Yours faithfully,

"Still Hoping."

Answers to Correspondents.

SPECIAL NOTICE.

In accordance with our present practice a smaller space will be allotted to replies to correspondents.

We will answer by post if stamped and addressed envelope is enclosed for reply: 5-cent International Coupon, from readers abroad.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

J. A.—The greatest variety of filter dyes is now obtainable from the Ilford Co.

M. H.—If your business is done locally you require a licence, the office for which is Iddesleigh Mansions, Westminster, S.W.1.

J. B.—You require a licence, and should apply to the Secretary, New Businesses Licensing Order, Iddesleigh Mansions, London, S.W.1.

V. B.—There is no information which can be given to you other than that you write to the secretaries, whose names are published, for prospectuses and entry forms for the exhibitions.

A. F.—You can get the so-called gold-dust (imitation gold) from any of the dealers in artist's materials, such as Messrs. Reeves and Sons, 18, Ashwin Street, Dalston, or Roberson and Co., 99, Long Acre, W.C.2.

H. C.—The 21 cm. (8¼ ins) lens had a pre-war price of £10, and should, we think, command that price, or even a pound or two more, at the present time to a direct purchaser. The lens was listed to cover a 7½ x 5 plate.

W. N.—We should prefer at least a 7-in. lens, particularly if an R.R.; but if your exposures are being made almost wholly at as small a stop as *f*/22, probably a 6-in. R.R., such as a Beck rapid symmetrical, would be quite satisfactory. At that aperture there would be very little to choose between the definition and that from an anastigmat.

J. T.—The reasons you give for the unsuitability of your present lens, namely, the long time required in focussing and the necessity to use a swing-back, are not clear to us, but for a studio of your length the maximum focus for a full-length cabinet is 10 inches.

F. F.—There is no method of making enlargements transparent, but the paper can be rendered somewhat translucent by the usual methods of ironing in paraffin wax or impregnating by swabbing the enlargements with a mixture of castor oil and volatile solvent —for example, ether.

J. N.—We are sorry we cannot give you any advice of practical value without seeing the tablet. In the ordinary way we should use an oblique lighting, rather diffused, but much depends on the amount of relief in the letters and that of any ornament on the margins or elsewhere.

E. H.—The book "Tom Wedgwood, the First Photographer," by Litchfield, was published in 1903 by Duckworth and Co., 3, Henrietta Street, Covent Garden, W.C. "The Romance of Modern Photography," by Gibson, is supplied by our own publishers, price 5s. 6d. post free.

A. J. R.—The office to which to apply as regards the licence is the Retail Business (Licensing) Section, Ministry of Labour, St. Ermin's Hotel, S.W.1. If you do not trade under your own name, you will require to register. The office for this is 39, Russell Square, W.C.1. There are no other restrictions on starting a business of this kind.

S. C.—1 and 5. Yes, in both cases. The office is Retail Businesses (Licensing) Order, New Arts Building, Liverpool. There is no charge. 2 and 3. It is purely a question of what you consider to be honest. There is nothing to prevent you. 4. We suppose that if you put a picture in a frame which you buy you may call yourself a picture framer. Surely this is a question an answer to which is useless.

V. P.—A condenser lantern, however much the light is diffused, always shows retouching in the enlargement more than does a lantern in which the negative is illuminated by reflected light or from a very diffused light-source, such as daylight or mercury vapour. Opal glass is a much greater diffuser than ground glass, and will diminish the prominence of retouching to some extent. Exposure will be very much longer; it can easily be five or ten times longer.

L. T.—It is rather difficult to suggest a cause from a print which is so very little spotted. We doubt very much if the brown spots are due to iron in the washing water; they have more the appearance of metallic impurities in the paper base, and it is quite possible that if we saw other specimens of the spot there may be reason for thinking that air-bells during fixing had something to do with them. Apparently the best thing you can do is to filter your tap-water through a flannel bag. If the spots then disappear, well and good; but if they do not, you will have to look in other directions.

J. B.—1. A wholesale business does not come within the scope of the Retail Businesses Licensing Order. Photography of any kind, however, does come within the scope of the Order, and if this business is being newly established a licence will be required. The office for your district is Queen's College, Paradise Street, Birmingham. 2. Copper certainly is liable to form an explosive compound with acetylene, and usually connecting pipes are of solid tinned copper or of iron. 3. If you have some experience and aptitude, postal lessons will benfit you very greatly. A good teacher is Mr T. S. Bruce, 4. Villas-on-Heath, Vale, Hampstead, London, N.W.

J. G.—Yes, the projection lens on the enlarger should be one which covers a half-plate to the corners in the ordinary way. You do not say what the light-source is in the enlarger, but, presuming it is one of relatively small size, such as an incandescent gas-mantle or an electric arc, probably the Dallmeyer will be the better lens of the two because of its larger aperture. The larger aperture of lens with ordinary light-sources obviates in a measure the difficulties in getting even illumination on the ground. In the case of an extended light-source, such as an illuminating chamber or a mercury tube, there is very little to choose between the two lenses on the ground of aperture, except that, of course, exposures would be somewhat shorter with the Stigmatic.

D. H.—If made up in two solutions developer should keep fairly well for months at a time; but we have no special formulæ which we can recommend to you other than those of the White Band Manufacturing Company, Progress Works, Selsdon Road, South Croydon. If you have not their latest complete circular of instructions we suggest that it would be worth your while to send for it and at the same time to ask for information as to the formulæ which they find to keep the best.

W. L.—Yoo do not tell us enough about the spots to enable us to do more than guess at the cause. If the light markings come up in development it is difficult to say what is the cause of them, but if they appear after prints have been fixed it seems possible that they may be due to drops of hypo solution dying on the prints. One or two of them have this appearance. The black spots may be due to dry developer dust or even dry particles of hypo settling on prints or paper before development. Unfortunately, you tell us so little about the stains that it is impossible to say more.

J. L.—There are two studio gas installations on the market, one or other of which will be much better for your purpose than any home designed or made apparatus They are the "Howellite," of Messrs. John J. Griffin and Sons, Kemble Street, Kingsway, London, W.C., and the "Powerful," of Messrs. Kodak, Ltd., Kingsway, W.C.2. Exposures with an extra rapid plate and f/4 lens usually run into four or five seconds for half-lengths or bust portraits. A gas installation is hardly the best thing for groups, but quite successful work can be done if you can supplement gas with a little flash light.

Aeroplane Photography.—A handbook on this subject is among the autumn announcements of the J. B. Lippincott Company. The author is Major H. E. Ives, the physicist son of Mr. F. E. Ives, who was actively connected with the United States Air Force Department.

The Scottish Salon.—Writing in reference to the notice of the forthcoming Scottish Salon, which appeared in last week's "B.J.," the Salon secretary, Mr. John Macdonald, makes a correction. The entry fee is two shillings per entrant, not for each entry form of eight pictures.

The British Journal of Photography.

Line Advertisements.

Charges for Insertion.

Since advertisements cannot be inserted until fully and correctly prepaid, senders of line announcements are asked to bear in mind the scale of charges. They will thus save themselves delay in the publication of their announcements. A Schedule by which an advertisement can be correctly priced will be sent on request.

Net Prepaid Line Advertisements.

12 words or less 1/-
Extra words ... ... 1d. per word.
(No reduction for a series.)

Special Note. Box Number Advertisements.

"Box No." and office address ... ... charged as 6 words.
For forwarding replies add ... 6d. per insertion for each adv't.
If replies are called for this latter charge is not made.

Advertisements cannot be inserted until fully and correctly prepaid.

Orders to repeat an advertisement must be accompanied by the advertisement as previously printed.

Advertisements are not accepted over the telephone or by telegram.

The latest time for receiving small line advertisements is 12 o'clock (noon) on Wednesdays for the current week's issue.

Displayed Adv'ts should reach the Publishers on Monday morning.

The insertion of an Advertisement in any definite issue cannot be guaranteed.

HENRY GREENWOOD & CO., Ltd., Publishers,
24, Wellington Street, Strand, LONDON, W.C.2.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3105. Vol. LXVI. FRIDAY, NOVEMBER 7, 1919. Price Twopence.

Contents.

	Page
Ex-Cathedra	645
Unreturned Proofs and the Photographer's Liability as to the Negatives	646
Practicus in the Studio. By Practicus	647
A Method of Vignetting for Daylight Printing Papers. By E. A. S.	648
The Scientific and Technical Group of The Royal Photographic Society	651
Assistants' Notes	651
Patent News	652
New Apparatus, etc.	653
Meetings of Societies	653
Commercial and Legal Intelligence	655
News and Notes	65
Correspondence— The Eternal Question—Barium Sulphide and Sulphide Toning. A Warning	655
Answers to Correspondents	656

SUMMARY.

In a week's time—namely, on Friday next, November 14—the pages of the forthcoming "B.J. Almanac" must be closed as regards the receipt of advertisements.

In a contributed article "E. A. S." describes in detail a method of vignetting negatives which allows of extremely perfect adjustment of the vignetting mask to the subject, and is very easily and quickly carried out. Ordinary dry-mounting tissue is used as the material of the vignette. (P. 648.)

Mr. T. H. Greenall sends a warning as to the use of barium instead of sodium sulphide for sepia toning, and mentions how the instanced drawback of barium sulphide may be avoided. (P. 655.)

A scientific and technical Group has been formally established within the Royal Photographic Society. Some particulars of its aims and programme will be found on page 651.

In a leading article we refer to a somewhat remarkable case in which proofs were kept for as long as thirteen years before being returned to a studio. We endeavour to come to a conclusion as to the legal position of a photographer in such or similar circumstances as regards his liability for custody of the negatives and for delivery of the portraits. (P. 646.)

In his article this week, "Practicus" deals with the utility of lenses of the telephoto type in photography such as very frequently is required from professionals. The special feature of the telephoto lens is its provision of long equivalent focal length in conjunction with relatively short camera extension. (P. 647.)

Some of the things which may advisedly be done beforehand for the purpose of smoothing the rush of Christmas work are the subject of a contribution to "Assistants' Notes." (P. 651.)

For occasional purposes advantageous use can be made of localised sepia toning of bromide prints. (P. 645.)

"Colour Photography" Supplement.

In a contributed article Mr. R. M. Fanstone has some advice to give on the choice of apparatus for the Autochrome and Paget colour processes, his hints extending to the selection of camera, lenses, and plate-holders. (P. 41.)

Some further hints on the working of the Paget colour process are contained in paragraphs on page 44.

Some further very general particulars have been published of the process of colour photography of S. M. Prokudin-Gorsky, the first announcement of which was made some weeks ago. (P. 44.)

A recent patent specification contains particulars of an invention the aim of which appears to be to provide a sensitive material ready for use in the making of two-colour or three-colour sets of negatives. (P. 43.)

EX CATHEDRA.

To Society Secretaries. Yesterday the secretary of every photographic society, the name of which is on our books, should have received the form of application for particulars of his association to be published in the Directory of Photographic Societies in the forthcoming 1920 "Almanac." In some cases, owing to the unavoidable abandonment of their offices by secretaries during the war, this form has been addressed to the meeting place of the society in default of particulars of the name and address of the secretary. We would ask the secretary of every society to take the necessary steps to send in the particulars which are asked for with as little delay as possible. Also, we would intimate to any secretary who, at the time of reading this notice, has not received our application to address a postcard to us, asking for an entry form to be sent to him. We are anxious to make the first post-war list of photographic societies as complete as possible, and in view of the changes which the war imposed upon many societies, can only do this through the friendly and prompt assistance of those who are now responsible for the secretarial management of societies.

* * *

To-day Week. On behalf of our publishers we desire to notify all intending advertisers in the forthcoming "Almanac" that Friday in next week, November 14, is the latest day for the receipt of advertisements. The firms who have not yet signified their wishes in respect to advertisements in the forthcoming volume will receive during the next few days a notice of this final date. We hope, however, that the present intimation will serve the purpose of making this final reminder unnecessary, and in that aim we emphasise the present announcement to all those under whose notice it comes. Unfortunately, the contract arrangements for the printing and binding of the "Almanac" make any extension of the scheduled date for closing its pages quite impossible.

* * *

Local Toning of Bromides. Most people are aware that self-toning collodion papers can be locally toned to a cool greyish tint by painting the parts which are intended to be of this colour with a strong solution of common salt before immersing the print in the usual fixing solution, but it has perhaps not suggested itself to many that it is easy to do the same thing with bromide prints, the only difference being that the brushwork is done upon the parts which are to be of a sepia tone, the image as developed furnishing the greys. All that has to be done is to apply the ordinary bleaching solution of ferricyanide and bromide to such parts as are to be toned, taking care to keep accurately to the outlines, and after washing, which should be done with a copious

supply from a rose, to immerse in the sulphide solution as usual. If by an accident the bleacher has gone beyond the proper limits the black colour can be restored by careful application of an amidol developer with a clean brush, and rinsing well before sulphiding. The process may not have any great value from an artistic point of view, but there are occasions on which it may be useful to be able to differentiate between different parts of a print by means of colour.

* * *

Copying Tables. Although a copying stand of some kind is usually found in studios doing a general class of business it is often too small in its dimensions to be useful for large pictures. Much loss of time is caused when one of these has to be copied, as it is often found in using a detached camera and easel that after size and squaring up are satisfactory the whole arrangement has to be altered to avoid reflections, whereas if the whole were fixed upon a movable base it could be swung round until satisfactory lighting is secured. A very large copy board is not needed, as its only purpose with large-framed pictures is to keep them at right angles to the lens. The camera may be fixed upon a platform supported by uprights, similar to those of the Hana or Semicentennial studio stands. But though no elaborate mechanism is needed for raising and lowering it, it may be placed at approximately the right height before putting the camera upon it. We have lately seen such a stand made for a picture dealer for the use of any photographer he might employ, and it struck us that the idea was one worthy of general adoption.

* * *

Finishing Commercial Work. The photographer who only occasionally undertakes commercial work is sometimes at a loss as to the best method of finishing unmounted prints, and in consequence his results are often disappointing when compared with the work of specialists. As a rule a glossy surface is preferred, and in this case a high degree of polish is necessary, nothing being less attractive than a print dried as it comes from the washing water. A good surface can be obtained by squeegeeing down upon ferrotype plates, and these require no treatment except an occasional rub with a soft rag moistened with a few drops of kerosene, afterwards polishing until all trace of bloom is removed from the surface. There is much less risk of "sticking" with ferrotype than there is with glass, but more care is needed to keep the surfaces free from scratches. These may be avoided by keeping the plates between blotting paper when not actually in use. Prints may easily be mounted upon linen or tracing cloth by means of the ordinary shellac tissue, this style being very suitable when the prints are required for travellers or showroom use. When card mounts are used, glossy prints should always be dry-mounted, as the gloss is perfectly retained. It is a little more costly than wet mounting, but the improved appearance will justify charging a little better price.

* * *

Large Prints and Exposure We are generally told that large heads require more exposure than half or full-lengths taken with the same lens used with the same stop. This is usually understood to be in consequence of the working aperture being reduced by the addition to the back conjugate focal length in consequence of the near approach to the sitter, but there is an additional reason, which is that the area of any ungraduated patch of either light or shadow is greater in the large image than in the smaller one, and, therefore, if viewed from the same distance the former will appear harder and less exposed. This condition, of course, obtains in enlargements from small negatives, but as these are usually viewed at a greater distance it is not so apparent. It is, however, recognised, for it is agreed that the ideal negative for enlargement is one more fully exposed and not developed to the same degree of density as one which is intended for contact printing. For the same reason large negatives are often printed upon distinctly rough paper, the grain of which helps to break up such ungraduated patches. One has only to compare prints (from a rather hard 15 × 12 negative) upon glossy P.O.P. with those on rough bromide or platinum paper to see how far this is the case.

UNRETURNED PROOFS AND THE PHOTOGRAPHER'S LIABILITY AS TO THE NEGATIVES.

The business of photographic portraiture has its own special small problems, of which, in the course of a somewhat lengthy experience, we imagined that we had considered at one time or another all the possible variations. Nevertheless, a particular case recently brought to our notice by a correspondent raises a point which we cannot remember having previously arisen, either in a court of law or otherwise. It may be useful to refer to it since, apart from its particular circumstances, it raises a question which is not by any means as well defined as it might be. Briefly, the facts stated by our correspondent are as follows: Four years ago he took over a photographic studio from the previous proprietor, the studio having been established a number of years prior to this transfer. Within the last few days he received from a lady a batch of untoned proofs of portraits taken thirteen years ago, and for which payment had been made at the time of the sitting, the proofs being accompanied by a request for delivery of the photographs. It appears that in the meantime the sitter, the son of the present applicant, had died, and the mother had therefore a special reason for wishing for the photographs. Our correspondent, however, has no knowledge of the existence of the negatives, has never seen them, and can find no record of them in his files. The question thus arises: What is his liability in respect to the order given, to a predecessor of his, nine years before he took over the business, and dormant for the long period of thirteen years?

In seeking to give an answer to the question we can only be guided by what would probably be the view of a court, for, so far as we know, no case in which the circumstances correspond with those we have mentioned has been the subject of legal action. One thing, at any rate, is clear at the outset, and that is that if anybody is liable for custody of the negative and delivery of the portraits, it is the present proprietor of the business. In acquiring the latter from the previous owner he took over both its assets and liabilities, even though the number and magnitude of both of these were not disclosed to him. But the chief question is whether anyone is now liable in respect to the custody of the negatives? On this general question there are, unfortunately, very few judgments from which to derive guidance. From such cases which have come into the courts, most of them in the comparatively early days of photography, it was clearly established that the right to the custody of the negative is the photographer's, but we cannot call to our recollection any equally definite ruling as to the sitter's right that a photographer should take due and sufficient care of a negative for the purpose of using it on further occasions as the sitter might direct. In view of the ease with which a fresh negative can be made from an existing photograph, it is not surprising that there should have been no cases on this point in the court, yet we doubt very much if a photographer's customer could demand as a legal

right the preservation of the negative throughout an indefinite period, for the problematical contingency of re-orders from it by the customer. If that is the case, and in our lay opinion it is, then we think it follows that in the circumstances set forth by our correspondent there is even less ground for supposing that the negatives should have been kept, and that the photographer is breaking a contract with his customer by having allowed the negatives to be lost. It seems to us that in such circumstances as these the photographer may be presumed to have done all that he could to have executed the order. The negatives were taken, proofs sent, and the portraits unquestionably would have been delivered if anything more had been heard of the proofs. We do not profess to have a professional knowledge of the various Statutes of Limitation, yet we think that an effluxion of time of thirteen years between the sending and the return of proofs deprives the customer of the right to take legal action in respect to the delivery of the photographs or the return of the money paid for them. It would be the same if the circumstances were in a measure reversed, and the photographer, after a similar lapse of time, were endeavouring to recover from the customer money which he would charge for a sitting, even though, from one cause or another, the actual portraits were not delivered. In other words, the problem which our correspondent has presented to us is not, we think, affected by the question of whether payment was or was not made at the time of the sitting. In these notes we have, of course, regarded the present applicant to our correspondent as possessing any rights which the original customer possessed, or imagined he possessed, at the time of his death. That raises considerations of an altogether different kind, which are, however, without relevance to the particular problem we have been considering.

PRACTICUS IN THE STUDIO.

[Previous articles of this series, in which the aim of the writer is to communicate items of a long experience in studio portraiture, have appeared weekly since the beginning of the present year. It is not thought possible to continue the series to the length of that by the same writer which ran through the "British Journal" some years ago, but if any reader among the younger generation of photographers, and particularly those engaged as assistants, has a particular subject which might be dealt with, his or her suggestion will be welcomed. The subjects of the previous articles of the series have been as follows :—

A Talk About Lighting (Jan. 3).
The Camera and the Lens (Jan. 10).
Managing the Sitter (Jan. 17).
Backgrounds (Jan. 24).
Studio Exposures (Jan. 31).
Artificial Lighting (Feb. 7).
Printing Processes for Portraiture (Feb. 14).
Studio Accessories and Furniture (Feb. 21).
The Surroundings of the Studio (Feb. 28).
Studio Heating and Ventilation (March 7).
The Postcard Studio (March 14).
The Printing-Room (March 21).
About the Reception Room (March 28).
Home Portraiture (April 4).
Portable Studios (April 11).
Copying (April 18).
Handling the Studio Camera (April 25).
More About Lenses (May 2).
Enlargements (May 9).
Advertising the Studio (May 16).
Mounts and Mounting (May 23).
Business Methods (May 30).
Photographing Children (June 6).
Portraits of Elderly People (June 13).
Something about Lenses (June 20).
Hand Cameras for Professionals (June 27).
The Dark-Room and Its Fittings (July 4).
Plates and Their Work (July 11).
Apparatus Repairs and Renovations (July 18).
Posing the Head (July 25).
Intensifying Portrait Negatives (Aug. 1).
Workshop Jobs (August 8).
The Personal Factor (Aug. 15).
The Keeping of Negatives (Aug. 22).
Reduction of Negatives and Prints (Aug. 29.)
Leaky Roofs (Sept. 5).
Blinds and Curtains (Sept. 12).
Miniatures (Sept. 19).
Printing Portrait Negatives (Sept. 26).
Wedding Groups (Oct. 3).
Combination Printing (Oct. 10).
Flashlight Work (Oct. 17).
Flashlight Portraiture (Oct. 24).
The Question of Outfit (Oct. 31 .

TELEPHOTO LENSES FOR PROFESSIONAL WORK.

As a body professional photographers do not seem to have taken very kindly to telephoto lenses, evidently considering them only fit for amateur "stunts," such as making large pictures of clock dials and weathercocks at a distance of half a mile or so. This feeling has, I believe, been created to a great extent by the specimen pictures published by the lens makers, who are naturally anxious to demonstrate to the utmost the capabilities of their instruments. It will perhaps help the professional to a better understanding of the telephoto lens if we consider it as an ordinary lens of greater focal length than usual, but needing only ordinary camera extensions—a lens, too, of which the focal length is adjustable, so that images on different scales may be obtained from the same standpoint. It will then be recognised that such a lens is a valuable tool in the hands of a practical man.

As many photographers have never troubled their heads about this kind of lens, it may be necessary to explain that in its simplest form it closely resembles one tube of an ordinary opera-glass—that is to say, it has a positive lens in front and a negative lens behind, with some arrangement for varying the distance between them. As a matter of fact, although not properly corrected for photography, it is possible to make very passable telephotographs with an opera-glass fixed on an ordinary camera. There is rather a large variety of sizes and models issued by different optical firms, but they may roughly be divided into three classes: First, non-adjustable—i.e., fixed focal length telephoto lenses, such as the Telecentric and Bistelar; second, telephoto lenses with an adjustment for varying the focal length, such as the Zeiss Magnar, Dallmeyer Adon, and others; and, third, portrait, rapid rectilinear, and anastigmat lenses, fitted with a telephoto attachment, which can be screwed on in a moment, when needed, without at other times interfering with the usual work of the lens.

The first class is usually of low magnifying power, and differs little from an ordinary lens in its manipulation. It is extensively used on reflex and other cameras for rapid exposures, and in some cases the large aperture ($f/5.6$) permits of portraiture in the studio. It should be noted that, in common with all telephoto lenses, the plate covered is small in relation to the focal length used.

The second class is useful for a wider range of subjects when rapidity of action is not essential. The little Adon is a well-known example of this type, and although simple in construction, is capable of much useful work. I therefore take it as a type to illustrate the working of telephoto lenses in general. The front or positive lens has a focal length of 4½ ins., and the back lens a negative or minus focus of 2¼ ins. By varying the distance between these by means of the rack adjustment we have a wide range of focal lengths. Thus with a camera extension of 5 ins. we have an equivalent focal length of 14½ ins. and a maximum aperture of *f*/13, the plate covered being 4¼ x 3¼. At 11 ins. camera extension the focal length is 26½ ins., the aperture *f*/26, and the plate covered about 8 x 6. At 20 ins. extension the focal length is 44½ ins., the aperture *f*/44, and the plate covered 15 x 12 These figures give a general idea of what a moderate-power telephoto lens will do.

The third class is usually of somewhat similar power to the Adon, as it commonly consists of a combination of a positive lens of any convenient focal length, with a negative lens of half its focal length, although for special work negative lenses having a focal length one-fourth that of the positive may be used. Such a combination is termed a high-power lens, as it gives a proportionately larger image with the same camera extension. I am purposely avoiding the term "magnifications," as this I consider has led to misunderstanding in the past. The equivalent focal length at the time of exposure is the point of interest to the photographer who does not care whether it results from three magnifications as compared with one lens or six with another.

The manipulation of a telephoto lens is quite simple, and the only difference from the ordinary procedure is that focussing is best effected by using the rack and pinion of the lens attachment instead of that of the camera. With a moderate-power attachment—that is to say, one-half the focal length of the positive—the equivalent focal length is twice the camera extension (measured from the back surface of the negative lens), plus the focal length of the positive lens. Thus, when using an 8-in. rectilinear fitted with a 4-in. negative lens, we have at an extension of 16 ins. an equivalent focal length of 40 ins., and so on for all other sizes. The focal length in this case being increased five-fold, the *f*/No. on the iris must be multiplied five times, so that *f*/8 temporarily becomes *f*/40. Having decided upon the camera extension, all that is needed is to rack the sliding tube of the attachment in or out until a sharp image is obtained. This must be done very slowly, much in the same way as when using the coarse adjustment of a microscope, or there is danger of passing and repassing the point of sharp definition without knowing it. It might be imagined that with apertures of *f*/40 or less long exposures would be required, but these are greatly reduced by another factor, the distance between lens and subject so that in many cases half or even a quarter the exposure indicated by a meter for an object, say, at 36 ft., would be sufficient.

A colour-screen usually adds considerably to the brilliancy of the result when distant views have to be dealt with, but it is not necessary for near subjects in which there is no perceptible haze over the deepest shadows.

Plates which give density readily are the best for this class of work, and I have found the "ordinary" and slow ortho rapidities preferable to extra rapid brands. The Imperial Special Rapid is about the fastest plate I should recommend.

Development usually takes longer than for close-up views. A full-strength developer should be used and development carried on until all action ceases. I have turned a plate face down supported by four bits of glass in the corners in a normal pyro-soda solution, containing a little bromide solution to prevent chemical fog, and left it for forty-five minutes, the resulting negative being an excellent one.

The applications of the telephoto lens are many and varied, and cover a much wider field than is generally imagined. In ordinary view work its value is obvious as its elasticity of focal length enables a subject to be taken from the most advantageous standpoint upon any desired scale, so that the proper amount can be included upon any size of plate. For architectural details it is unrivalled, whether the result is a fine piece of carving for study or illustration, or a piece of faulty work, cracked or subsided for use in a legal action. When the London tubes were projected the houses under which the tunnels would pass were carefully surveyed and telephotographs taken of all existing cracks or distortions before commencing work. In quite another field of study photographs of statues scores of feet above the ground were taken for the purpose of identifying them as the work of the same artist, little mannerisms being clearly shown in the prints.

For catalogue work, especially of small articles which have to be depicted in their full size, or nearly so, the telephoto lens is again a winner. Let anyone compare a print of a snuff-box taken full size with, say, a 12-in. lens and a telephoto at 20 ins. camera extension. For flower photography the telephoto is excellent, much greater depth of definition being obtainable, while some lenses add a slight softness to the outlines which gives a better idea of the texture than the dead sharp images usually obtained.

For portraiture its use is somewhat limited on account of the small working aperture of most models, but the Telecentric makes an excellent portrait lens. Lenses upon the same principle are, I believe, to be placed upon the market by two other firms.

The foregoing is not in any way intended to give full working instructions, but rather to outline the properties and uses of the telephoto lens to those who have hitherto neglected it. Several excellent books have been issued on the subject, and these can be referred to for fuller information.

PRACTICUS.

A METHOD OF VIGNETTING FOR DAYLIGHT-PRINTING PAPERS.

THE following notes are primarily intended for the attention of any who experience trouble in vignetting. These, judging from results not infrequently seen, even in show-cases, where, presumably, the best work is displayed, are not in an altogether negligible minority. This proviso in advance is necessary, for the writer, more than once, has found that photographers who will gladly consider any general ideas new to them, are immediately up in arms when a suggestion is made with regard to vignetting, for the very sufficient reason that their particular method is invariably the best. Quite recently a professional potentate from overseas, the president of important federations and so forth, and an extremely clever and artistic worker, absorbed with avidity some assorted tips, but froze several degrees below zero on the subject of vignettes. "Let me show you my way," he remarked, and in doing so recovered a genial temperature. His plan was the well-known expedient of covering the back of the negative with tissue-paper or papier minerale, and working thereon with blacklead and stump, the vignette being either a plain or serrated opening in brown-paper or thin card. With presentable negatives and printing

to daylight, and also with bromide papers and printing boxes, possibly the method is as good as can be wished for, and that being so, there was no reason why he should have considered an alternative.

Mercury Lamps and Vignettes.

But this worker, unlike the writer, was not working with mercury printing lamps, an ideal substitute for daylight, apart from vignetting, nor had he to cope with and make the best of a variety of negatives, including the apparently hopeless. With double-tube lamps, though they cannot compare with good daylight as regards diffusion, vignetting is still fairly easy, but with single-tube lamps, presenting as they do one bar of light, conditions are not so favourable, and it was to meet these that the method to be discussed was devised. It is one not new in its main principle, but in details—making all the difference as a practical proposition—it is believed novel.

Excellent diffusion with a single-tube lamp can, of course, be obtained by placing white tissue-paper over the opening in the vignette, but as this slows printing 50 per cent. and upwards, it is ruled out of court with dense negatives; also electric current costs money, economical as the lamps are in consumption of current.

It almost goes without saying that any method of vignetting that will work well with these lamps will answer even better with daylight.

The Pear-Shaped Vignette.

The various ways of vignetting recommended from time to time are outside the scope of these notes. Except the obviously unsuitable, most have been tried with the lamps, and none appear to possess sufficient flexibility or adaptability for negatives of widely different character and printing value.

The reign of the pear-shape vignette is almost over, and deservedly so, even if one has a sneaking and debased affection for it as a relic of the past. Assuredly, if its exponents had existed in the time of Noah, and an order had been placed for "head and shoulders" vignettes of the animals in the Ark, a portrait of the giraffe would have been printed under the orthodox vignette.

But the fundamental objection to this vignette is often found present in modified form in present-day vignette sketch portraits. Take the case of two heads fairly close together on one plate—how frequently does one see an ungraduated tint of medium depth between them marring the sketch effect. Or in the case of, say, a little boy with legs sturdily apart, a meaningless variation of depth in the background, sharply bounded on each side by his lower extremities.

Although some operators do wonders in improvising serrated vignettes out of those in stock, yet in the majority of cases the making of a vignette to suit each negative guarantees the best results and has invariably been adopted by the writer except with identical poses. During the war, when all had to turn their hands to the pumps, he made many hundreds, if not thousands, by the method now to be discussed.

Outline of Procedure.

An "improved" retouching desk is improvised out of a large picture frame set at a convenient angle by rigid struts, and is furnished with a reflector of white blotting paper. A regular retouching desk will not be found so handy. The negative is adjusted to the desk, glass side towards the operator, a piece of white tissue paper is placed over it, and a line is drawn right round the figure (assuming a "full-length" is being dealt with), about half-an-inch beyond it. This margin will naturally vary according to circumstances. A touch of gum is centrally applied to the other side of the tissue paper, which is stuck down on brown paper or thin card, and the vignette opening is cut out. A piece of adhesive dry-mounting tissue is placed over the opening, and caused to adhere by touches of the hot iron. The embryo vignette is adjusted to the negative and centred, the outline of the figure is traced round with a sable brush, using dye in methylated spirits and spirit varnish as pigment. The negative is then slid on one side, and strokes, broadening as they progress, are made round the outline. Using a pen trimmer on zinc, the outline is cut out, and the vignette shown diagrammatically in fig. 1 results. The example represents one for a little boy.

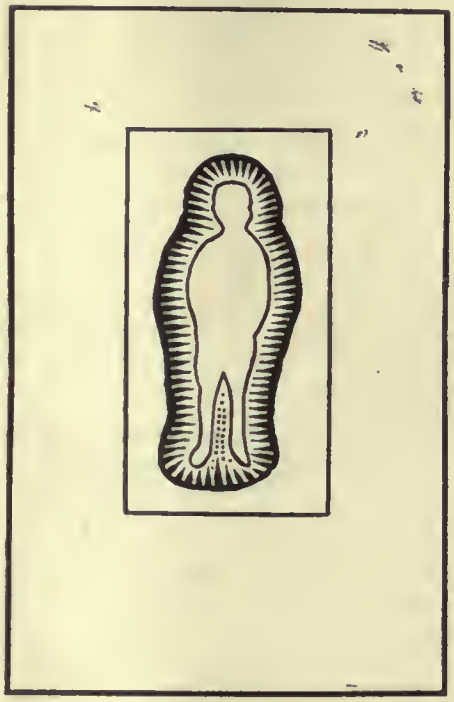


Fig. 1.

This, of course, is a variant of the oft-suggested method of employing ordinary tissue paper and water-colour pigment to the same end, one open to several objections. With tissue paper, if the central part, representing the outline of the figure, is cut out, the edge usually is far too harsh; if left intact, printing is slowed unduly, and the vignette cannot be adjusted by inspection from the front. With the newer way, thin waxed paper has been found sufficient for diffusion. On the other hand, with very thin and quick-printing negatives, tissue paper or ground-glass should be employed.

Psychology.

"If the guv'nor caught me using adhesive tissue for vignettes, I should promptly get the sack," pleasantly observed an assistant, by way of testimonial, on being shown this method. Aforesaid "guv'nor" was employing platinotype papers printed to mercury light, and throw-outs due to faulty vignetting were by no means unknown.

Experience has shown that diverting the tissue to a use it was never designed for has materially cut down waste. Dealing with all sorts of negatives, good, bad, and indifferent, rarely is a first proof thrown out merely for faulty vignetting. The less expensive waxed paper may be substituted for the tissue if preferred, and for large vignettes will appeal. It is stuck down by small pieces of tissue interposed between it and the brown paper or card, the tissue being one of the few things that will stick waxed paper. In practice, pieces of the tissue cut from the smaller vignettes are saved, and employed for sticking the waxed paper utilised for the larger, and it may be mentioned that the thin and translucent tissue sold by the Adhesive Dry Mounting Co. alone has been used, though doubtless many other brands would be equally suitable.

Although hardly to the point, it may be added that stored packets of silver papers can be kept largely free from injurious atmospheric influences by wrapping them in one or two folders of waxed paper and then running round the edges a line of thick orange shellac varnish, which, when tacky, is sealed with the hot iron; or long strips of adhesive tissue can be employed instead. The folders should be larger than the packets of paper, so that the heat of the iron is not transmitted to their contents.

Some Suggestions.

Frequently a figure taken with a table or chair adjacent will be the better if these accessories are subordinated. In such cases the opening in the opaque paper or card is cut sufficiently large to include them, but the adhesive tissue is outlined strictly round the figure and cut out. Long and gently tapering strokes of the brush, placed close together, or otherwise, as occasion demands, will give softness, and additional pieces of the tissue, each piece in advance of the next, can sometimes be added with advantage.

Backgrounds which print unequally can be levelled-up by placing strokes close together over the parts of lesser density, and spacing more widely over the more opaque parts. Similarly, too heavy printing, say, on one side of a face or bust, can be lightened by advancing a piece of tissue, serrated, if necessary, over such parts. The frequent case of the legs of a child printing too heavily can be corrected by spanning the vignette with a bridge of tissue. If insufficient in holding-back power, dots of paint can be added. Even central portions printing too dark can be held back by dotting the diffuser of the vignette with paint, a method which gives wide control but necessitates a proof as a guide.

Following the figure round will sometimes produce peninsulas (as in fig. 1), which insist on drooping towards the glass of the negative. Take a piece of sewing cotton, pass under, and fasten at each end with an applied bit of the adhesive tissue. Or the drooping piece can be attached to the diffuser of the adjusted vignette, freeing one end and slipping a hand under, followed by a light touch of the iron.

Bust Vignettes.

A very efficient device for the lower part of bust vignettes consists in cutting out of thin card half-circular or V-shaped openings of various sizes and contours, which are faced with three layers of adhesive tissue, each layer projecting about ⅛ in., more or less, from its neighbour, according to the size of the vignette and its distance from the negative. Fine strokes, close together, are added. Fig. 2 will make the device

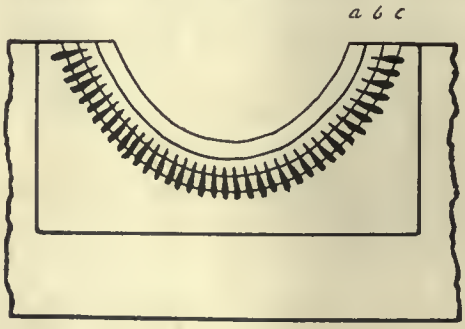


Fig. 2.

plain, *a*, *b*, and *c* being respectively one thickness, and two and three thicknesses of the adhesive tissue. With a fair assortment, nearly every "head and shoulders" vignette can be fitted, and the beautiful way in which they will vignette off a dark coat must be seen to be believed. The lower part of the vignette proper, viz., for the head and shoulders, naturally receives no treatment.

The Dye Mixture.

The mixture recommended dries rapidly, and adheres well to waxed paper and especially so to adhesive tissue. Finely ground lamp-black as a pigment was first tried and found unsatisfactory, clogging and going ropy in use. Having some methyl violet dye at hand, this was substituted and has worked extremely well.

A little methylated spirit and ordinary spirit varnish are mixed approximately in the proportion of two parts of the spirit to one part of the varnish, and a few grains of the dye on the point of a knife are added and well stirred in. If on application to the tissue the mixture spreads, more varnish is required; if the colour be too pale, a few more grains of the dye are added. A very little experience will enable one to keep the compound in good condition, but occasionally it will be found advisable to allow the spirit to evaporate, when, with fresh additions of the three constituents, it will be in working order again. An ounce of the dye is sufficient for thousands of vignettes. If, perchance, any of the dye mixture gets on the clothes, place blotting paper on the other side, apply methylated spirit freely, and hope for the best. A No. 7 round red sable brush, as used for oil painting, is a convenient size, and with ordinary care will last for years.

Convenience in Working.

To avoid fouling the ferrule or handle of the brush, it is essential to keep the dye mixture in a jar with a wide mouth. Vaseline is sometimes supplied in small glass jars *without contracted neck*, fitted with aluminium screw-on covers, and these answer admirably. Some old rags and a second corked jar containing methylated spirit for cleaning the brush must also be at hand.

Fig. 3 shows in place a convenient arrangement, representing a cover of a half-plate plate-box acting as a tray, the jar, and

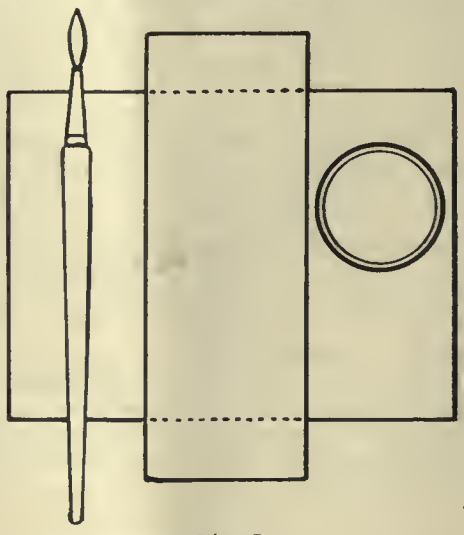


Fig. 3.

half of a half-plate negative (cut longways) to act as a palette. The brush is held in V-cuts. When charged with pigment, the hairs of the brush are allowed to rest on the bottom of the tray, to avoid any chance of fouling the V-cuts and indirectly transferring the dye to the fingers.

When a batch of negatives is being dealt with, it is a mistake to finish one vignette before the next is put in hand, as this will mean many unnecessary fox-trots between retouching desk and working bench, possibly of benefit to the corpulent, but involving waste of time. In practice the negatives are laid in a pile, are outlined as already described on cut sheets of tissue paper, which receive the numbers of the negatives. As dealt with, they are placed in another pile, which will correspond

with the order of the tissue papers. This is preserved during the subsequent operations, and a return to the retouching desk is only made when all the openings have been cut out and the adhesive tissue is attached.

Things to Avoid.

A consideration of the choice and lighting of backgrounds would demand an article in itself, but a few words on "undesirables" may be added.

For sketch portraits, naturally, the lighter and flatter the background the easier the vignetting and the better the effect. A crease in the background much in evidence in negative after negative may engender in the printer language which need never have been induced. "Cloudy" backgrounds are veritable brutes for vignetting, except when the corners only are covered and the lower-middle class nature of the thing is preserved. The plain background which normally prints the same decided tint as a flatly lit face often acquires, is a feature that never would be missed, for however soft the vignette may be, the general effect is a wash-out. A light background dropping on to a much darker floor covering is another combination not welcomed by the printer. Of a different nature, but extremely awkward from a vignetting aspect, are the included hands and arms of a proud mother in dark clothes supporting an astounded baby, set against a white background. Here a pair of white cotton gloves and overalls for the parent would often save the situation, or, at least, mitigate its severity.

E. A. S.

THE SCIENTIFIC AND TECHNICAL GROUP OF THE ROYAL PHOTOGRAPHIC SOCIETY.

The negotiations with the Council of the Royal Photographic Society regarding the establishment within the Society of a sub-body or group specially charged with the duty of encouraging and advancing the scientific and more technical branches of photography have at length been brought to a conclusion, and the "Scientific and Technical Group," as it is to be called, will very shortly be beginning its work as a kind of corporate body. The movement is one which most emphatically is deserving of all the support which those members of the Society interested in its special aims can give it, for, apart from its general aim of advancing in particular the more scientific and technical branches of photography, its constitution has been formed along lines which give to the Group a measure of self-management and permit of its members having a stake in its organisation and prosperity. A scheme of this kind is no doubt the best for the purpose, and, it is to be hoped, will achieve the results which the pioneers in the establishment of the Group have set before themselves.

The activities of the Group as at present defined may be broadly stated to be the provision of scientific or technical lectures or papers to be delivered at the meetings of the Society held on the second Tuesday in each month. Such meetings will, of course, be open to all members of the Society, whether members of the Group or not. The Group may also offer abstracts of papers, original communications, etc., for publication in the Society's "Journal," and may further prepare and print for circulation among its own members abstracts, translations, or communications which may be judged to be of too technical or special a character for the wider publication in the "Journal" of the Society. Such work as this latter, and also the administrative work of the Group itself, is to be paid for from the funds of the Group.

The subscription for membership of the Group has been fixed at 7s. 6d. per annum, which in the future will be due on January 1 of each year. Payment of this subscription now confers, however, membership of the Group until the end of 1920, and if made on or before to-day week (November 14) gives the entrant the right to nominate six members for election to the administrative committee of the Group. Up to the present 137 members of the Society have shown their interest in the movement by sending in their names, with expressions of their desire to participate in the work of the Group. Apparently it is the intention of the Group to issue a list of its members, and to indicate by a system of alphabetical marks the subjects in which each member is particularly interested. The subjects thus singled out as representing the field of work of the Group are as follows:—Colour photography; cinematography; manufacture of photographic materials; photographic appliances (cameras, lenses, etc.); photo-mechanical processes; photo-micrography; pictorial and record photography; radiography; scientific applications of photography (astronomy, spectroscopy, etc.); sensitometry, and theory of photography.

It may be hoped that all those members of the R.P.S. who have the wish to further the advancement of these branches of photography will signify it by enrolling themselves as members of the Group, which they can do by sending the subscription for 1920 to Mr. F. F. Renwick, 35, Russell Square, London, W.C.1.

Assistants' Notes.

Notes by assistants suitable for this column will be considered and paid for on the first of the month following publication.

Getting Ready for Christmas.

I suppose that almost every studio photographer in the Kingdom is now looking forward to Christmas with somewhat mixed feelings, the extra cash coming in being somewhat discounted by the long hours of work. Now much time is wasted in many studios by using apparatus that is not in perfect order. Dark slides that require careful handling to prevent them falling open, cameras with loose backs, and many other little defects of a like nature, waste absolutely hours in some businesses. It may therefore be useful to look over some likely causes of trouble, and indicate how they may be met. This is a good time to set one's house in order, because although a defective piece of apparatus may work tolerably well when time is taken to humour its little whims, when it is used at a real rush job, such as most jobs will be in the coming season, it is apt to fail lamentably.

Let us take the camera first. Almost the most common fault is a loose back, caused by the locking nut failing to grip. This, of course, leads to out-of-focus negatives. Sometimes all that is required is a washer between the nut and the camera frame, but it is often necessary to renew either the nut or the pin on to which it screws. Any of the big makers will supply small fittings such as this. Any holes in the camera bellows should receive attention. If large, they may be covered with black court-plaster, but if only small pinholes they may be filled with a paste composed of powdered graphite in Seccotine. This is also handy for filling in any holes in the woodwork. Cracked lens panels are not uncommon, but they should be replaced at once, or trouble is sure to ensue. If it is inconvenient to replace them, strips of wood should be stuck on the front of the panel across the crack, and the back should be covered with black velvet. This last is a good tip for all lens-boards, as it not only prevents any possible light-leakage, but also makes sticking of the lens-panel almost impossible. However, all cameras will not permit of the slight extra thickness.

Any missing screws should be replaced; sometimes they seem of very small importance, but their absence throws a great strain on those that remain. If the screw-hole has become enlarged it must be pegged with wood; match-sticks are often useful: they should be smeared with Seccotine, forced well into the hole, and then cut off flush with the woodwork.

It is a risky thing to use an unsafe dark-slide at any time, but when doing rush work it is simply asking for trouble. A most annoying defect is the coming unhinged of the centre partition. This usually becomes slightly displaced, with the result that the slide either refuses to shut at all, or shuts incompletely; in the latter case fog is almost sure to result. Cloth hinges may be replaced by anyone of average dexterity, but metal hinges, unless it is just a case of lost screws, should be handed over to an expert. The catches holding the slides shut often become loose, with disastrous results. In the case of the L-shaped catch now generally fitted a tap with a hammer, to bend in the outer end of the L, will often do much good. Safety catches, to prevent slides being drawn except when required, often get out of order, but a screw-driver, a pair of pliers, and a little common-sense will usually bring them right again. Tripods are usually kept in pretty good repair, because

it is next to impossible to work at all with a faulty tripod; but sometimes the ferrule becomes loose, which results in slipping, and much annoyance.

I have left the shutter to the last of the camera parts. Sometimes a roller-blind, or studio shutter may be improved in its working by a clean of its working parts: a few slight adjustments are within the scope of the average "Pro," but serious damage is almost sure to result if anyone but an expert tackles the repair of a diaphram shutter.

The lenses are unlikely to benefit by any attention, other than a good clean, which they should certainly have

To depart from the actual operating gear. The enlarging lantern should be overhauled, and lamp-house and illuminant thoroughly well cleaned, but the most usual trouble with lanterns is a jerky, focussing movement. This is often caused by looseness of the clamping screws. A great improvement may often be effected by rubbing graphite from a "lead" pencil in all the places where wood slides over wood.

Any stray light from the lamp house or from the body of the enlarger should be cut out; it is a most frequent cause of fogged paper. The easel will probably repay a little attention; the clips, bars, or whatever it is that holds the paper, should be adjusted, and if the easel is one of the type that folds back for placing the paper it should be seen to that it comes up truly vertical, or else it will be impossible to get sharp focus all over the enlargement.

Printing boxes are usually kept in good order, because any defect is at once noticed, but it is as well to see that the arrangement for providing pressure on the paper is in order; also the felt pad should be renewed when becoming worn, or else unsharp prints, and even broken negatives may result.

In the dark-room the safe-light should be cleaned; broken dishes, or even cracked ones, should be replaced. And any taps that require washers must be attended to.

The dry-mounting press may be heating unevenly, which may result in the print sticking and the fissure failing to do so. This may be improved by a thorough clean out of the heating system, and, in the case of gas, by having the pipes blown through.

This note is not intended to be a complete list of all the ills that apparatus is heir to, but it may serve to point out a few of the most usual points to look to.

In conclusion, it is always as well to get in a small stock of "breakables," such as focussing screens, dishes, and bottles, before a rush. Then any accident is not so serious.—ARTHUR G. WILLIS.

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Applications October 20 to 25:—

WATER FILTER.—No. 25,857. Photographers' water filter. J. E. Duggins.

ROLL-FILM ADAPTER.—No. 25,965. Roll-film spool adapter. J. P. Dukinfield.

PROJECTION APPARATUS.—No. 26,123. Optical projection apparatus. J. M. McAlery.

COPYING-ENLARGING APPARATUS.—No. 25,964. Apparatus for making photographic enlargements, reductions, and reproductions. E. Pascault.

CINEMATOGRAPHY.—No. 25,887. Shutters for cinematograph machines. W. Branson.

COMPLETE SPECIFICATIONS ACCEPTED.

These specifications are obtainable, price 6d. each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

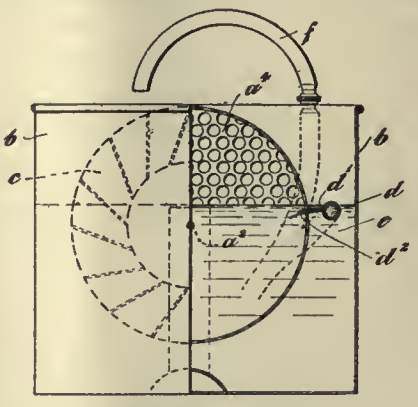
SENSITIVE UNITS FOR COLOUR PHOTOGRAPHY.—No. 128,781 (August 1, 1918). The invention consists in producing a coloured picture, in which are employed (1) a support consisting of a film coated on both sides with a light-sensitive film, and (2) a paper or other support coated with a sensitive film on one side. These films, after treatment, are caused to form coloured component pictures, and are stuck together to form the composite three-colour photographs. The chief feature of the invention is that one of the supports before exposure is mounted in a frame, and remains therein until the various treatments and the assemblage of the two films have been effected. Further details of the process are given on another page in the "Colour Photography" Supplement. Jens Herman Christensen, Villa Sterrehus, Sövejen, Söllerød, Holte, Denmark.

ROTATING PRINT WASHERS.—No. 132,978 (February 28, 1919). The invention is of apparatus for washing photographic prints, films and the like of the type having a perforated drum adapted to revolve in a tank holding water filled to a predetermined level in such a manner that the drum wherein the prints or films are placed is partially submerged or revolving in water when the apparatus is in use, means being provided for rotating the drum.

According to the invention a pipe disposed externally of the drum is perforated in such a manner that jets of water from the tube are directed at right angles through the surface of the drum to prevent the films from adhering to the inside of the drum, and also to assist in the complete agitation of the water.

Conveniently the drum may be driven by the usual water wheel, and the pipe, which may be submerged beneath the water, may be branched from the main supply pipe which feeds the water wheel in such a manner that water under the usual pressure from the main supply passes along the pipe and into the drum.

The drum is formed of perforated sheet metal, one section of



the circumference being adapted to form a lid a^1 for the insertion and removal of the prints; the drum is mounted to rotate on pivots a^2 in a water tank b, and is provided at the one end with a water wheel c, and to which a supply of water is directed for the purpose of rotating the drum.

In a position outside the drum and parallel to the axis of the drum a water supply pipe d is fixed, preferably in a position just below the level of the water e in the tank b, which water level is preferably above the pivot a^2 upon which the drum revolves, but below the upper part of the circumference of the drum. This supply pipe d is provided along its length with a series of perforations d^1, which are adapted to form outlets from which jets of water d^2 emerge, the jets of water being adapted to take such a direction as to pass through the perforations in the drum into the interior, and thereby displace any of the prints which may have adhered to the interior surface of the perforated drum, and which jets of water d^2 are adapted to agitate the water in the drum in such a manner as to separate the prints in the drum. The perforated supply pipe d is preferably arranged on that side of the drum in which its circumference leaves the water e in the course of its rotation. J. and R. Oldfield, Limited, and Bernard Leslie Oldfield, both of Refulgent Works, Warwick Street, Bordesley, Birmingham.

MARKS PLACED ON THE REGISTER.

The following marks have been placed on the register:—

E. P. G. DESIGN.—No. 391,449. Photographic paper. Eric Purselove Glover, 5, Park Lane, Leeds, Yorkshire; manufacturer and publisher of photographic specialties.

OSDA.—Nos. 392,325. All goods included in Class 39. The Houghton-

Butcher Manufacturing Co., Limited, Clifford Road, Walthamstow, London, E.17; manufacturers.

OSDA.—No. 392,326 All goods included in Class 8. The Houghton-Butcher Manufacturing Co., Limited, Clifford Road, Walthamstow, London, E.17; manufacturers.

New Apparatus, &c.

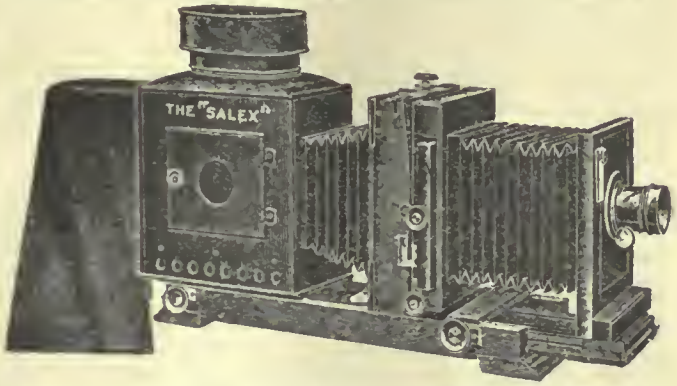
A Vertical Photo-Micrographic Camera. Made by C. Baker, 244, High Holborn, London, W.C.

A PIECE of apparatus for the microscopist who requires to carry out photo-micrographic work with the minimum degree of disturbance of his ordinary use of the microscope has been designed by Messrs. Baker in a most excellent manner. The photo-micrographic camera is held vertically, so that it is only necessary to bring the microscope underneath it, and to make a temporary light-tight junction of the two. For such a purpose as this rigidity is, of course, everything, and, therefore, it is well that we should say that it is impossible to speak too highly of the solid construction of the stand which supports the vertical camera. The

main upright is of solid steel, as is also the auxiliary swinging pillar to which the camera is attached. A pair of equally solid bearings allow of the camera being raised as a whole, and of its being drawn out to any required extension. Both these adjustments are instantly made rigid by the strong clamps which are provided. The camera has a maximum extension of 18 ins., and closes to within 4 ins. It is provided with a ground-glass focussing screen, with clear glass centre for critical focussing, one double dark-slide and self-contained shutter. In the quarter-plate size, the only one in which the outfit is at present obtainable, the price is £8 15s.

The Salex Enlarging Lantern. Sold by the C y Sale and Exchange, 81, Aldersgate Street, London, E.C.1.

THIS enlarging lantern embodies most completely the various features which of late years have come to be regarded as desirable, indeed almost essential, for convenience in the making of enlargements. These concern chiefly the negative stage which in the "Salex" is a detachable frame fitted with rotating turntable by which the negative image can be angled in any desired manner on the easel. This is done by rack and pinion adjustment, and the same convenient adjusting means are provided for up and down movement of the negative as well as for tilting the entire negative stage at an angle to the axis of the lens. The bellows connection between the condensers and the lamp-house is instantly removable, giving easy access to the condensers. The lamp-house itself is provided with rack and pinion adjustment, whilst the extension of the enlarger front is most ample, sufficient for the making of lantern slides from negatives by projecting them upon a reduced instead of upon an enlarged scale. The front itself is fitted with rising and falling panel, a feature which theoretically may be entirely wrong, yet in practice is found frequently to be of real service. The whole apparatus impresses us as being very well designed and made. It is supplied in six sizes, for negatives 3½ x 2½, quarter-plate, 5 x 4,



postcard, half-plate, and whole-plate. In quarter-plate size, with 5½-in. condenser, the price without lens is £11 10s., in half plate size, £17 2s., and in whole-plate, £30.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

SATURDAY, NOVEMBER 8.

Manchester Amateur Photographic Society. Annual Exhibition. "Days Off with a Reflex." J. Shaw.

SUNDAY, NOVEMBER 9.

United Stereoscopic Society. "Marine Photography." F. J. Mortimer.

MONDAY, NOVEMBER 10.

South London Photographic Society. "Pictorial Photography in Practice." G. C. Weston.
Dewsbury Photographic Society. "Y.T.O. Printing." L. A. Dawson.
Willesden Photographic Society. "Bromide Printing." M. O. Dell.
Bradford Photographic Society. "Manipulation of the Negative for Pictorial Purposes." H. G. Grainger.
Manchester Amateur Photographic Society. "The Fascination of Ireland." Miss Edna Walter, B.Sc.

TUESDAY, NOVEMBER 11.

Royal Photographic Society. Presidential Address.
Hackney Photographic Society. Points in Composition. Illustrated by Lantern Slides.
Doncaster Camera Club. Lantern Lecture, "Scenes from the 'Raider's' Country." E. S. Maples.
Chelsea Photographic Society. "Hand Work on Negatives." B. C. Wickison.
Birmingham Photographic Society. "The Carbon Printing Process." G. Whitehouse.
Manchester Amateur Photographic Society. "Birds in the Garden." Rev. B. Butler, S.J., M.A.

WEDNESDAY, NOVEMBER 12.

Croydon Camera Club. "Bromoil Demonstration." G. B. Clifton.
Dennistoun Amateur Photographic Association. "Photographic Experiments." R. Allan.
Partick Camera Club. "Electrical Apparatus for Photography." H. Laing.
South Suburban Photographic Society. "Bee-Keeping in Many Lands." H. E. C. Carter.
British and Colonial Camera Club. "Gloucester and its Associations." W. F. Kuner.
Photo-Micrographic Society. "Spiders; their Structure and Habits." Dr. G. H. Rodman.
Manchester Amateur Photographic Society. "By Lake and River." J. D. Berwick.

THURSDAY, NOVEMBER 13.

Liverpool Amateur Photographic Association. "Bromoil." J. B. Potts.
Hammersmith (Hampshire House) Photographic Society. "Portraiture." E. Naame.
The Camera Club. "An Evening in Lakeland." A. Knighley.
Richmond Camera Club. "The Amateur Photographer" and "Photography" Lantern Slides.
Brighouse Photographic and Naturalist Society. "Belgium (pre-war), India, Norway, Spain, Morocco, Madeira and Canary Islands." J. C. North.
Aston Photographic Society. "Mounting and Framing." Mr. Morroll.
Wimbledon Camera Club. "Nooks and Corners of Old London." C. W. Forbes.
Hull Photographic Society. "Glimpses of Japan." A. E. C. Hindson.
Manchester Amateur Photographic Society. "The Home of the Rajput." E. W. Mellor, F.R.G.S.

FRIDAY, NOVEMBER 14.

Royal Photographic Society. "Southern Italy." W. Sanderson.
Manchester Amateur Photographic Society. "A Naturalist in the Isle of Man." F. Taylor.

ROYAL PHOTOGRAPHIC SOCIETY.

MEETING held Tuesday, November 4, Mr. A. H. Lisett in the chair.

A demonstration of the Raydex process of three-colour printing was given by Mr. F. R. Newens, who very successfully carried through the making of a three-colour print from the set of bromides taken from the customary colour-sensation negatives. The process is one abounding in details of manipulation, a feature of it which makes it difficult to devise anything spectacular in the way of a demonstration. Mr. Newens was therefore compelled to follow a somewhat humdrum course, and to explain to his audience the

operations involved in the process and the little niceties of manipulation which contribute to successful practice. If he said much by way of precaution, it was no doubt for the reason that he assumed entire unfamiliarity with the process on the part of his audience, by no means a bad rule to follow, but one, perhaps, which can be adopted by a demonstrator sometimes to an excessive degree. It must, however, be said that Mr. Newens provided the opportunity of members seeing for themselves the very simple and comparatively rapid operations which produce a three-colour print by the Raydex process. The lecturer uttered a plea for a greater degree of interest in the process by pictorial workers. He pointed out that the majority of the people who had taken up the process had done so chiefly out of a technical interest in its capabilities. Very few of them were artists, and, therefore, when he (the lecturer) looked at the monochrome work (on the walls of the lecture room) which formed the pictorial section of the Society's exhibition he felt convinced that there was a very great possibility in the process, if those whose aim and training was strictly artistic would test its capabilities.

On the conclusion of the demonstration questions were asked and answered, and on the proposition of the chairman the very hearty thanks of the meeting was accorded to Mr. Newens.

CROYDON CAMERA CLUB.

Mr. F. C. Reynolds, forsaking for once his specialty "polarised light," gave an admirable exposition on "Colour," illustrated with many beautiful and ingenious experiments. With photography pure and simple the lecture had but little to do, though naturally connected with the art of the camera throughout. Some of the links might have been forged stronger, and doubtless in any repetition of a lecture worth many repetitions this will be effected. (Should this guileless observation put Richmond or Hammersmith on the track of Mr. Reynolds, he will kindly blame the triple-entente and not the reporter.)

When lecturing he has the happy knack of conveying the impression of being, so to speak, part and parcel of his audience—"just one of you chaps who has studied light and colour, you know," and happy to have an opportunity to chat about it. Yet, paradoxically, never does he assume his hearers know anything about the subject, and consequently he makes himself understood by all, including those whose intelligences have expanded in other, and often unknown, directions. Nevertheless, just one little trap he fell into when considering the "additive" and "subtractive" systems of colour reproduction, by attempting to explain the difference between them in more than few words and less than many words. The main idea embodied in each is clearly grasped, and was clearly described by him, but further elaboration leads to subtleties, not so easy to understand, and requiring full examination.

It would be highly inconvenient to attempt to allude to the many instructive experiments shown; even a deaf member would have been interested, and in addition would have understood a good deal. A very convincing experiment consisted in projecting on the lantern screen a brilliant continuous spectrum, and then passing along it discs painted with pure colours, which acquired different colours and depths down to blackness, as they progressed. Usually demonstrations on colour fixes the beginner with an idea that any subject including yellow, green, and red is outside the pale of an "ordinary" brand of plate. Mr. Reynolds supplied an efficient antidote for the misconception. "Suppose," said he, "we take a piece of glass coloured red throughout, which only permits the red of the spectrum to be transmitted, an ordinary plate will be practically blind to such rays. But if we take the glass, powder it to a pigment degree of fineness, and spread it on any surface, it can be photographed by the white light now reflected from its surface, along with the red, to which the plate is insensitive." And so with every red pigment known.

Mr. Reynolds' opinion of artists considered as experts in the theory of colour may be described as not being highly appreciative. Still, it may be hinted that many do know how to lay the stuff on and that a realisation of the theory of colour is no more necessary to them than is a knowledge of the ionisation of gases to bring a kettle to the boil on a gas-ring. Mr. Purkis, in the discussion, agreed that artists, as a rule, did not understand colour primaries. Much of the muddle was due to terminology. What an artist might term "red" might be a "magenta." Similarly, if one asks a dyeman for "red," a "magenta" is usually supplied. If you want a "red," ask for "scarlet."

A most hearty vote of thanks was accorded Mr. Reynolds for an evening of exceptional interest, one which must have involved a large amount of preparation.

EDINBURGH SOCIETY OF PROFESSIONAL PHOTOGRAPHERS.

Visit to Glasgow.

At the invitation of the Glasgow Professional Photographers' Golf Club, the members of the Edinburgh Society spent a most enjoyable day at Glasgow on Friday, October 31. Some ten members left Edinburgh by the 10 a.m. train, and arriving at their destination an hour later, were met by the Glasgow men. The party then started by motor for Hillfoot Golf Course, situated some miles distant, and lying in a most beautiful part of the country. Even for the one or two who did not play, the walk round the course and the sight of the autumn landscape which was thereby afforded them were sufficient enjoyment in themselves. On arriving at the course the party were entertained to lunch in the club-house, and a photograph having been taken—upon what was a unique occasion in the annals of professional photography of the two cities—the players were arranged, and drove off. The weather was of the best, and the game was greatly enjoyed by all—in spite of the sad fact that Edinburgh was beaten by five games to three.

Afternoon tea having been served, the party now returned by train to the city. On arriving at the low-level station at Queen Street, and ascending the steep stair to the realms of light and air, the twenty stalwart golfers, labouring under the weight of clubs and the day's achievement, were obliged to pass between two swarthy ticket-collectors. It was considerably to the mortification of the party, therefore, when one keeper of the gate was heard to observe to his fellow, over the heads of his victims, "There'll be nae gress left on Hillfoot Golf Course the day, Charlie!"

The Edinburgh men were now entertained to dinner, where they were joined by others of both cities who had not participated in the game. A letter of apology for absence had been received from Councillor Drummond Shiels, of Edinburgh.

Mr. Drummond Young, president of the Edinburgh Society, was formally introduced by the captain of the Glasgow Golf Club, Mr. Weir. It had been at the back of their minds, said Mr. Weir, that the formation of the golf club among Glasgow photographers has been merely a preliminary step toward the forming of a professional society in that city, and that in this connection Mr. Young would speak upon the experiences of the Edinburgh Society. Mr. Young then gave a brief account of the work done by the society since its inception, explaining its aims and objects, and advocating strongly the inauguration of a society upon similar lines in Glasgow. The value of an association to any kind of business man was pointed out, and it was suggested that the societies of both cities could afterwards amalgamate to form the nucleus of a Scottish Society of Professional Photographers. Several questions were then asked and suggestions made, and it was generally felt that such an association should immediately be formed in Glasgow.

Mr. Young then proposed the health of the Glasgow men, and thanked them heartily on behalf of himself and his fellow-members for the delightful day and the lavish hospitality which had been given them, and he extended to his hosts an invitation to come through to Edinburgh in the spring when, it was hoped, the men of Edinburgh would be able to reverse both the kindness and the score. The toast of the guests then followed, and Mr. Young, in replying, proposed the health of Mr. Robt. Scott, of Kodak, Ltd., who had been chiefly instrumental in organising the Glasgow Golf Club, and to whose credit, along with that of Mr. Robertson, the success of the day had been due. Mr. Scott thanked the meeting in an eloquent and thoughtful speech.

The Edinburgh party returned by the 9 p.m. train.

Mr. Robert H. Rice, whose complaint of alleged profiteering figured in the report of the Professional Photographers' Association published last week, asks us to correct the name of the district given as that of his place of business; this should have been Waltham Cross, not Walthamstow.

Commercial & Legal Intelligence.

At the London Bankruptcy Court on Friday last the first meeting of creditors was appointed to be held under the failure *re* Richard Cardwell Barron, of 7, Queen Street, Bloomsbury, W.C., photographer, lately carrying on business at 19, Cheapside, E.C., and lately residing at Shedfield, Ashley Road, Thames Ditton.

The Receiving Order was made on the petition of a creditor, the act of bankruptcy being the debtor's failure to comply with the requirements of a bankruptcy notice. The debtor had not surrendered under the proceedings, therefore no information was available as to his liabilities and assets. An officer of the Court had attended at the debtor's various addresses, and found that he had not been seen at any of them for some time. The debtor's wife had been found, but she stated that she had been separated from the debtor for 8 or 9 years, and during that period he had not contributed towards her support. There was no property at her address belonging to the debtor, and she knew nothing about his affairs. The Official Receiver went to Shedfield, Ashley Road, Thames Ditton, and was told that the debtor left there about three months ago. It was stated that at Thames Ditton he went in the name of Barron, Sandey, and Smith. The debtor formerly rented the house at £45 per annum in the name of Sandey, but he left in June last owing a quarter's rent, and the landlord was making a claim against him for dilapidations. As there was not a quorum of creditors present no resolutions could be passed, and the estate was formally left in the hands of the Official Receiver.

Legal Notices.—A first dividend of 5s. in the £ has been declared in the estate of Henry Arthur Yvery Heathcote, photographer, of, and lately carrying on business at, 22, St. James' Street, Piccadilly, London. The dividend was payable on November 6, 1919, at the offices of the Trustee, 1, Guildhall Chambers, Basinghall Street, E.C.

A first and final dividend at 11s. 7½d. in the £ has been declared in the case of Charles Frederick Siedle (trading under the style of Siedle Bros.), 60, Walter Road, Swansea, and 13, Heathfield Street, Swansea, photographer. The dividend was payable on November 6 at the Government Buildings, St. Mary's Street, Swansea.

News and Notes.

The Ujah Ointment Company, of Cheadon Street, Oxford, has just issued a six page circular of testimonials from those who have benefited by the use of the Ujah preparations in the treatment of developer skin poisoning. A copy of the leaflet is obtainable free on application.

Edinburgh Glasgow Golf Match.—As reported on another page, professional photographers of Edinburgh and Glasgow, on the occasion of a joint meeting held at Glasgow on Friday last, October 31, took part in a very enjoyable golf match on the Hill-

[*Photograph by Romney, Glasgow.*

Left to Right: Standing.—Messrs. J. W. Romney, (Glas.), Thomson (Edin), Moffatt (Edin.), Whyte (Glas.), Mitchell (Glas.), Drummond Young (Edin.), Scott (Edin.), Polmont (Helensburgh), Macalpine (Edin.), Scott (Glas.), Scott (Edin.), Rushbrook (Edin.), Balmain (Edin.), Black (Glas.), Phillips (Edin), Dewar (Glas.).
Sitting.—Messrs. Weir (Glas.), Yerbury (Glas.), Whyte (Glas.), Robertson (Glas.), Seagell (Glas.), Romney (Glas.).

foot course, the use of which was kindly granted by the Douglas Park Club. We are indebted to the firm of Mr. George Romney, of Sauchiehall Street, for the photograph of the party on the golf course.

Packard Shutters.—Messrs. J. H. Dallmeyer, Ltd., of Church End Works, Willesden, N.W.10, advise us that they have been appointed sole agents for the United Kingdom for the celebrated "Packard-Ideal Silent Studio Shutters," and that a very large consignment has just arrived, enabling them to supply any of the various sizes listed from stock.

Aerial Photography.—In the House of Commons during the week-end Lieut.-Colonel Moore-Brabazon asked the Under-Secretary of State to the Air Ministry what steps, if any, have been taken to use the experience obtained during the war in aerial photography for mapping purposes towards revising and helping in ordnance survey work in England, in view of the fact that so many maps are now out of date?

Major-General Seely: As my hon. and gallant friend is aware, the Board of Agriculture is responsible for Ordnance Survey Maps. A Committee, with representatives of the War Office, Admiralty, and Air Ministry, have been considering the general question of maps, including those specially required for air purposes, for which, undoubtedly, aerial photography will be of the greatest value.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

THE ETERNAL QUESTION.

To the Editors.

Gentlemen,—Regarding the letter from "Still Hoping" in the issue of 31st ult., may I suggest that a great improvement in conditions would undoubtedly be effected if assistants would join the National Union of Shop Assistants?

Efforts to form a "Photographic Assistants' Union" are apparently hopeless; the proposal to form a Union under the auspices of the P.P.A. will appeal to very few assistants.

Possibly the Union of Shop Assistants would lend their organisation for the formation of a photographic section.—Yours faithfully,

A. W. Woodmansee.

185, Crown Street, Peterborough, November 3.

BARIUM SULPHIDE AND SULPHIDE TONING.—A WARNING.

To the Editors.

Gentlemen,—Owing to its better keeping qualities and greater convenience in handling, the substance being a dry powder which appears to be non-hygroscopic, the use of barium sulphide in sulphide toning is increasing amongst amateurs. I should, however, like to point out that, unless the prints are very well washed before putting in the barium solution, and also between the barium solution, and any clearing bath which may be used, there will be formed in the emulsion insoluble salts of barium, which in the case of glossy papers may utterly ruin the surface of the print. Amongst these insoluble compounds I may mention the sulphate, phosphate, chromate (yellow), and ferricyanide. Needless to say the corresponding sodium salts are soluble, so that no trouble of this kind arises when sodium sulphide is used.

Should, however, it be desired to continue the use of the barium compound, the remedy is quite simple. Before using the barium solution add to it a little solution of Glauber's salt. This, if sufficient be added, precipitates the whole of the barium as sulphate, in which form it is quite innocuous, whilst the sulphide remains in solution in combination with the sodium of the Glauber's salt. It is not necessary to filter, as the barium sulphate quickly settles. The cost of the Glauber's salt is a few pence per pound. Of course, this is exactly equivalent to using sodium sulphide in the first instance.—Yours faithfully,

T. H. Greenall.

Chorley, November 4, 1919.

Answers to Correspondents.

SPECIAL NOTICE.

In accordance with our present practice a smaller space will be allotted to replies to correspondents.

We will answer by post if stamped and addressed envelope is enclosed for reply: 5-cent International Coupon, from readers abroad.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

W. P. S.—According to the latest edition of Kelly's Directory there are 12 there.

J. E.—We do not think that you will gain anything by the arrangement you sketch. You would do better, we think, to add two more lamps to your existing installation.

W. N.—Sketch portraits are not made by bleaching, but by vignetting and blocking out. You will find full working instructions on their making in the little manual, "Sketch Portraiture," which our publishers issue, price 10d. post free.

R. K.—Most of the exhibitors at the exhibition of the Royal Photographic Society are open to supply duplicates of their exhibits. The prices in many cases are stated in the catalogue. In others, no doubt they are obtainable direct from the exhibitors, addresses of whom you will find in the catalogue.

D. K.—We think under the New Retail Businesses (Licensing) Order the addition of dealing in apparatus and materials to your present business would be regarded as the establishment of a new retail business, and in that case you require to obtain a licence for the addition. The office for your district is 15, Athol Crescent, Edinburgh.

J. W.—1. Canvassing for enlargements is certainly a business within the Retail Businesses (Licensing) Order. Any licence would apply only to one particular town. 2. You would have to obtain a licence to take ferrotype portraits, and in this case also a different licence would have to be obtained according to where the work is done.

H. G.—If the half-tone block is at all a decent one you ought to get a very much better print from it than the specimen sent, which is a very poor thing. We think your best plan would be to send the block to a photo-engraver, and get him to make the best etcher's proof from it. It is quite impossible to make a copy from the block itself.

J. B.—1. You certainly require a licence, the office for which is 99, Queen's Gate, South Kensington, S.W.7. 2. Generally speaking, such functions require to be taken in at least 12 × 10 size, and the best camera, for the sake of lightness of weight, is one of the somewhat tapering-bellows type such as the Watson "Acme." The lens should be one of about 16-in. focal length.

S. AND H.—As, apparently, you are aware, no licence is required for amateur developing and printing business which is obtained through the post or through the medium of advertisements in newspapers which circulate throughout the country. But if a regular photographic business of any kind is started a licence is required. The office for your district is 80, Westbourne Terrace, Paddington.

C. L.—The Retail Businesses (Licensing) Order applies to any kind of photographic business carried on regularly—that is, with people in the neighbourhood. It would certainly apply to you, and the office to which you should apply is Harehill Barracks, Leeds. In some towns the authorities also insist that a house-to-house canvasser for portraits should have a hawker's licence. You can only ascertain this by making application to your local head police office.

C. A. C.—The fixing bath formula in the "B.J." which is made up with metabisulphite is just as good for gaslight papers as the acid hardening fixing bath containing also alum. Both of these baths may be used for both plates and papers without any harm, so long as they remain free from stain, but it is a mistake to use baths for prints which have been much used for plates since it is difficult to tell from the appearance of the print whether it has been fixed thoroughly or not. There is no special necessity to varnish negatives which have been intensified by the chromium method. Such negatives are quite as permanent as those unintensified.

G. K.—The only two systems of gas lighting for studio work are the "Howellite," of Messrs. J. J. Griffin and Sons, Ltd., Kemble Street, Kingsway, W.C., and the "Powerful," of Messrs. Kodak, Ltd., Kingsway, W.C. Both of these installations will certainly give decent results, but exposures are relatively long, five or six seconds under good conditions of lens and plate, and the heat of the burners (there are about 20 of them) makes the installation unsuitable for use in summer in a studio of small size or in any room which is not very well ventilated. The cost of the installation is, or was, about £5.

A. N.—The number of lamps or total candle-power depends upon the shortness of the exposure required; for very rapid work 6,000 c.p. is needed, but in the ordinary way 3,000 c.p. (say six 500 c.p. lamps) will be sufficient. If these are placed in a curve so that the first is opposite the middle of the background about 8 ft. away and 8 ft. from the floor with the others rather lower until the end one is near one side of the studio and about 6 ft. high, you will have a good general arrangement. The box arrangement would be rather too concentrated. The best way of fixing is to have the counterbalanced reflectors as sold by the General Electric Company, 67, Queen Victoria Street, London, E.C.

A. F.—1. The office for your district is 99, Queen's Gate, South Kensington, S.W.7. 2. It is doubtful whether the taking of photographs for the newspapers is a retail business according to the Order, but certainly a licence for ordinary portraiture would also cover the making of photographs for the newspapers. 3. You do not tell us the working space so we cannot tell whether we are recommending a lens of too long focus, but your requirements will be best met by a carte-de-visite portrait lens of 6 or 7 in. focal length. This will give you very fine definition on a quarter of a ¼-plate, as good as any you can get with a much more expensive anastigmat, and the lens will be more rapid than any of these latter. If you want a shorter focus than 6 ins., the best choice you can make is one of the high-class *f*/4.5 anastigmats, such as the Cooke or Ross "Xpres."

The British Journal of Photography.

The Oldest Photographic Journal in the World.

PUBLISHED EVERY FRIDAY. ESTABLISHED 1854. **PRICE TWOPENCE**

TERMS OF SUBSCRIPTION, POST FREE.

UNITED KINGDOM.—One Year, 10s. 10d.; Six Months, 5s. 5d. Three Months, 2s. 9d.

CANADA ... ... AUSTRALIA ... ... NEW ZEALAND ... ... SOUTH AFRICA ... ... UNITED STATES OF AMERICA SOUTH AMERICA ... ... INDIA AND FAR EAST ... ... CONTINENT OF EUROPE ...	*One Year.* Thirteen shillings (13s.), or 3 dollars 17 cents, or 22 francs, or 9 rupees 12 annas, or 6 yens 30 sens.
FEDERATED MALAY STATES, BORNEO AND SARAWAK	5 dollars 57 cents.

HENRY GREENWOOD & CO., LTD., Proprietors and Publishers, 24, Wellington Street, London, W.C.2.

IMPORTANT NOTICE TO READERS.—Until further notice agents will supply the "B. J." to order only, as the high price prevailing for everything in connection with newspaper production prohibit the distribution of surplus copies for chance sales. It is therefore necessary in order to ensure the regular delivery of the "B. J." each week to place an order definitely with a dealer, newsagent or bookstall clerk, or to send a subscription to the publishers.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3106. Vol. LXVI. FRIDAY, NOVEMBER 14, 1919. Price Twopence.

Contents.

	Page
Ex-Cathedra	657
Outdoor Work in Winter	658
Practicus in the Studio. By Practicus	659
Making Money with a Motion-Picture Camera. By Ernest A. Dench	661
Price Policy in Commercial Photography. By G. D. Crain, Junr.	662
Trade Marks in China. By W. B. Kennett	664
New Apparatus, etc.	667
Meetings of Societies	667
Commercial and Legal Intelligence	669
News and Notes	670
Correspondence— The Eternal Question and the P.P.A.—A Simple Varnish for Negatives and Prints — The Eternal Question — Photographic Goods and the Profiteering Act — Unreturned Proofs and the Photographer's Liability as to the Negatives	670
Answers to Correspondents	672

SUMMARY.

Advertisements which are "definitively" received by noon to-morrow (Saturday) may still be in time for inclusion in the forthcoming "B.J. Almanac."

The complex questions concerned in the preservation of rights in trade-marks in China was recently the subject of an exhaustive paper read before the Shanghai Advertising Club by Mr. W. B. Kennett, who dealt at length with the various methods open to European firms in protecting themselves against infringement of their trade-marks by other Europeans and by Chinese and Japanese merchants or manufacturers. (P. 664.)

In a contributed article Mr. Ernest A. Dench writes in an optimistic spirit of the business which may accrue to the photographers taking up the use of the cinematograph camera. (P. 661.)

In his article this week "Practicus" deals with some of the questions which arise in making a change from one studio to another. These concern not only the lighting conditions, but also business and social matters which have their influence upon the maintenance of the previous patronage of the studio which is taken over. (P. 659.)

A writer in "American Photography" on the making of photographs for commercial purposes emphasises a caution as to the mistake of quoting low prices in the idea that they will appeal simply on account of their lowness. (P. 662.)

The death has occurred of one of the old professional photographers, Mr. J. T. Chaffin, of Yeovil. (P. 663.)

A case of some interest in connection with the prices of mounts was heard on Tuesday last in Shoreditch County Court, when judgment was given on the price question and also on the point as to whether goods retained for a considerable period by a customer had or had not been ordered. (P. 669.)

The dinner of the Croydon Camera Club last week was a happy resuscitation of a function which in pre-war days was among the most enjoyable of the photographic year. (P. 668.)

In outdoor photographic work in winter some very ordinary yet important precautions need to be taken as regards the care of outfit, choice of plates, and avoidance of moisture. (P. 658.)

Particularly for work in winter there is an advantage in making up developing solutions of quadruple the normal strength so as to allow of the working developer being compounded, when necessary, with a larger proportion of pyro. (P. 657.)

A further means of obtaining prints of decent contrast from negatives taken under dull lighting conditions is mentioned on page 658.

One or two minor items which contribute to the satisfactory use of festoon blinds in the studio are the subject of a paragraph on page 657.

EX CATHEDRA.

To-morrow Only. Although we announced last week that to-day, Friday, is the latest time at which advertisements may be accepted for the forthcoming "British Journal Almanac," we learn from our publishers that it will probably be possible for them to include in the volume announcements the order for which is definitely given before noon to-morrow, Saturday, November 15. In the case of these eleventh-hour orders, it is understood that the "copy" for the advertisement follows immediately. Time presses; a large part of the "Almanac" is now in the printers' hands, and the prompt setting and proofing of the advertisement section are necessities for the carrying out of the scheduled programme of printing and binding, details of which, in the case of a large book like the "Almanac," have to be settled long in advance.

* * *

Strong Developers. Although most plate-makers publish formulæ for making pyro-soda developers in quantities of 80 ounces of each solution, this is not always the best way of mixing the developer. It permits of dilution, but does not provide for increasing the strength should occasion arise, nor does it allow the proportions of soda and pyro to be varied in a convenient manner. For example, it is impossible even to double the amount of pyro in the mixed developer, as there is only the required quantity in the pyro solution before any soda is added. In the winter it is often desirable to use a more concentrated developer to obtain density from rather flat subjects, especially copies. This is quite easy if the solutions are made up to 20 ounces only in bulk, the same quantity of chemicals being used as for the 80 ounces of the original formula. There need be no confusion in diluting to normal strength, as it is only necessary to take as many drachms of each solution as ounces of developer are required, and to make up to the full bulk with water. If double the pyro only or double the soda be required, the extra quantity of concentrated solution is added, and then diluted to make the same bulk. In cases where the solutions are not used in a day or two the stronger solution will be found to have much better keeping qualities.

* * *

Festoon Blinds. There are one or two little details in connection with the fitting of festoon blinds which it is as well to bear in mind. One is that the wires used should be as smooth as possible; a good tinned or galvanised single iron wire is better than a twisted or plaited cable. Another is that the wire should not be too thick, as a thick wire needs a very strong pull to keep it taut. The rings on the curtains should be large enough to pass over the straining bolt, so that it is not necessary to

take the latter off the wire every time the curtains have to be washed or cleaned. During the winter the white curtains should be frequently washed, and this is easily done if they can readily be dismounted. It is an excellent plan to have two sets, so that a clean set can replace the soiled ones at once. There is then no occasion to hasten the laundry folk, and if the washing be done at home there is no need to remove the rings if these are solid brass. If electro brass or tinned iron rings are used there is a great risk of iron-mould stains, which cannot occur with brass rings. For the dark blinds, black or other dark-coloured Bolton sheeting, as was used for Zeppelin blinds, will be found a very satisfactory material: not only is the fabric thicker, but there seems to be much less tendency for the colours to fade.

* * *

Greater Contrast from Winter Negatives Owing to the softer lighting prevalent during the winter it is often difficult to obtain a sufficiently brilliant result in the finished print. Many photographers' showcases can give abundant evidence of this in the case of football or other groups, taken perhaps late in the day. The negatives give prints lacking in contrast and in the brilliance beloved of the non-photographic public. Under these conditions it is a good plan to increase the contrast of the picture by the following simple means. The negative is slightly under-developed, yielding an image on the weak side. The prints are made upon one of the vigorous grades of gaslight paper, the idea of slightly under-developing the negative being to produce a negative more suited to the paper and preventing the harshness that would result if the negative were of full density. It is surprising what a great deal of increased contrast may be obtained in this way, and the plan is commended to all photographers engaged in out-of-door work during the winter season.

* * *

Time Saving. In many businesses a great saving of time, not to say an avoidance of error, might be made by giving distinctive letters and numbers to the various articles and styles dealt with instead of giving a more or less detailed description in words. During the war we have got accustomed to this method in connection with Government forms, and we realise how much time is saved by asking for Army Form 6142 instead of giving details of the application or report which it is desired to make. This principle is particularly suitable for the photographic industry, where a multiplicity of sizes, colours, surfaces, and mounts have to be dealt with. One large trade firm has already done this, and has issued samples bearing distinguishing letters and numbers, so that if a customer requires a glossy print sepia-toned with white margin he has only to give the size and a certain number, say A.2, to ensure accuracy in the execution of his order. Some of the enlarging firms have tried to do something in this way by giving fancy names to the styles, but this is clumsy, and more likely to lead to mistakes, besides not allowing for slight variations in style to be readily classified. In large portrait businesses each current style might be numbered on the same system, saving space in booking and preventing misunderstanding in the work rooms.

* * *

The Choice of a Camera. We are sometimes asked by beginners in portraiture to advise them in the selection of their studio outfit, without any indication as to the class of work they propose to do, as if there was a standard camera which would be suitable for any studio in any locality. This is, of course, very far from being the case, as the apparatus which is suitable for a high-class business is not likely to be the best, irrespective of cost, for a cheap one. The orthodox 12 x 10 studio or salon camera with a repeating-back attachment for cabinets is undoubtedly the best one to choose for the first, while the second must be fitted with such an apparatus as will allow a large quantity of work to be done with the smallest expenditure of material and labour. If small "panels," passport portraits and post-cards form the bulk of the work, one of the special cameras made to give a number of exposures upon one plate will be found most useful, this being supplemented by a camera, say of whole-plate size, which could be used for cabinet portraits and groups as well as general outdoor work. In order that portrait lenses could be used this camera should be of the parallel bellows form, and should be provided with a studio stand as well as the usual tripod.

OUTDOOR WORK IN WINTER.

While the amateur worker can pick and choose the opportunities for satisfactory work during the winter months, his professional brother has to take things as they come, and to obtain the best results which are possible in the case of groups, estate subjects, or other outdoor commercial work with which he may be commissioned. Therefore, he is under the necessity of adjusting his practice to the very different conditions of the season, on which subject some few notes may be not without interest. If some of the points upon which emphasis is laid seem to be obvious, it may be urged in extenuation of their mention that cases frequently come to our notice where their neglect is the cause of work of indifferent quality.

In the first place, something requires to be said on the greater degree of protection which apparatus requires during the damp winter months than is often given to it. A stout case, waterproof and damp-proof, may be set down as an absolute necessity. For such a case there is no more suitable material than leather, but if the present considerable cost of a leather case is an objection, a very efficient substitute may be found in a box made of the light three-ply wood and covered with waterproof canvas or twill. A case of this description will give not the slightest ground for complaint as regards its satisfactory protection of the apparatus, if the precaution be taken to keep the camera and slides well wrapped within it in a waterproof focussing cloth. This latter may be regarded as an essential in outdoor winter photography in any circumstances where the care of an expensive camera is a consideration. Apropos of this matter, it is worth while to remind the photographer that an outfit which has been used throughout a day of damp weather should be given rather more than ordinary care on the return to the studio. It is worth while to take the trouble to open out the camera and wipe it thoroughly with a dry cloth, for there is certain to be a film of moisture over the instrument, no matter how waterproof the case may be. It is just as well to leave the camera fully extended in a warm, dry room for a few hours, and attention to these points will be found to be the secret of keeping the apparatus in first-class condition and of avoiding the warping of its more delicate woodwork.

In the matter of plates a common mistake is that of using the fastest plates which can be got. For all stand-camera work the photographer is immensely better equipped with a fairly slow plate with which contrast can readily be obtained, and which, moreover, is one that may be forced in a slightly warm developer in order to bring out shadow detail. Unless a special subject calls for a plate of the orthochromatic or panchromatic variety, the outdoor worker is best equipped for the difficulties peculiar to the winter season when his dark-slides are loaded with plates of "ordinary" rapidity, that is to say, of a marked speed of about 100 H and D. In conjunction with a fairly con-

centrated developer it is remarkable what superior results may be obtained under dull weather conditions in comparison with those made on plates of the ultra-rapid kind. For hand-camera work a faster plate is, of course, a necessity, but here again there is a positive advantage in using one which is several degrees short of the most rapid obtainable, and thus facilitates the making of negatives of decent contrast under unfavourable conditions. The softer lighting of winter, while it imposes the necessity of lengthening hand-camera exposures where possible, is undoubtedly best compensated for by the use of a plate which is generally classed simply as "extra-rapid."

A further matter for caution, in avoiding flat results, is the freedom of the surfaces of the lens from condensed moisture. Photographers are generally familiar with the deposition of moisture when a lens is taken from a cold atmosphere into one which is both warm and charged with moisture. But in continuous outdoor work in winter dimming of the lens surfaces readily occurs in a variety of circumstances, and is one of those things which is apt to escape observation. A final polish of the glass elements is one of those things which ought not to be neglected, on which account the type of lens consisting only of two cemented combinations is on this score preferable to that in which a number of single elements make up the objective. It is a matter of a few seconds to polish the surfaces of the former, whereas in the case of the latter the removal of the glasses by chilled fingers is a thing to be avoided. A preparation, "Clarocit," is now obtainable from Fallowfield's and other large dealers, the application of a thin film of which to the lens surfaces will go a long way towards obviating a deposit of moisture which can have any injurious effect.

A further point to which reference may well be made is that of developing plates as soon as possible after exposure, or at any rate keeping them in a dry condition until development. Gelatine is a material which absorbs moisture readily, and though exposed plates in a dry condition retain the latent image in an unimpaired condition for a very long time, it is, we think, not safe to assume that the same holds good when the plate is damp. Although we cannot recall any scientific measurements in support of the belief, we think the keeping of plates in a damp state for some days between exposure and development is a cause of flatness and weakness in the negative.

The photographer himself must not be neglected in these winter provisions. The outdoor worker who may have to spend a day on damp ground should look to his own comfort in the way of footwear. Stout boots should be worn, and may well be further brought into waterproof condition by plentiful application of a preparation such as dubbin. Many, too, will find a pair of leggings or puttees a positive comfort in keeping the whole body comfortably warm. No photographer can expect to do work to his full satisfaction when hands and feet are cold. Although gloves are felt to be awkward by many in handling focussing gear or other parts of the apparatus, yet if it is possible a pair of stout woollen gloves (better than leather on account of their flexibility) should be worn as much as possible, or if they are objected to a pair of knitted mittens, which leave the fingers free and unrestricted, are not to be despised in very cold weather.

PRACTICUS IN THE STUDIO.

[Previous articles of this series, in which the aim of the writer is to communicate items of a long experience in studio portraiture, have appeared weekly since the beginning of the present year. It is not thought possible to continue the series to the length of that by the same writer which ran through the "British Journal" some years ago, but if any reader among the younger generation of photographers, and particularly those engaged as assistants, has a particular subject which might be dealt with, his or her suggestion will be welcomed. The subjects of the previous articles of the series have been as follows:—

A Talk About Lighting (Jan. 3).
The Camera and the Lens (Jan. 10).
Managing the Sitter (Jan. 17).
Backgrounds (Jan. 24).
Studio Exposures (Jan. 31).
Artificial Lighting (Feb. 7).
Printing Processes for Portraiture (Feb. 14).
Studio Accessories and Furniture (Feb. 21).
The Surroundings of the Studio (Feb. 28).
Studio Heating and Ventilation (March 7).
The Postcard Studio (March 14).
The Printing-Room (March 21).
About the Reception Room (March 28).
Home Portraiture (April 4).
Portable Studios (April 11).
Copying (April 18).
Handling the Studio Camera (April 25).
More About Lenses (May 2).
Enlargements (May 9).
Advertising the Studio (May 16).
Mounts and Mounting (May 23).
Business Methods (May 30).
Photographing Children (June 6).
Portraits of Elderly People (June 13).
Something about Lenses (June 20).
Hand Cameras for Professionals (June 27).
The Dark-Room and Its Fittings (July 4).
Plates and Their Work (July 11).
Apparatus Repairs and Renovations (July 18).
Posing the Head (July 25).
Intensifying Portrait Negatives (Aug. 1).
Workshop Jobs (August 8).
The Personal Factor (Aug. 15).
The Keeping of Negatives (Aug. 22).
Reduction of Negatives and Prints (Aug. 29.)
Leaky Roofs (Sept. 5).
Blinds and Curtains (Sept. 12).
Miniatures (Sept. 19).
Printing Portrait Negatives (Sept. 26).
Wedding Groups (Oct. 3).
Combination Printing (Oct. 10).
Flashlight Work (Oct. 17).
Flashlight Portraiture (Oct. 24).
The Question of Outfit (Oct. 31).
Telephoto Lenses for Professional Work (Nov. 7).

CHANGING QUARTERS.

There are few photographers who work throughout their career in the same studio. It may be that a change is necessitated by municipal improvements, the expiration of a lease, or by the opportunity arising of securing more desirable premises. In most cases it will be found that the new quarters require a little "getting used to," and the ease with which this is done largely depends upon the knowledge of essentials possessed by the photographer. Many of us recollect a *cause*

célèbre of a few years ago, when a Society artist who moved into a new studio in the same street as the old one, but with a different aspect, brought an action for damages against the firm who had designed it on the grounds that it was impossible to produce a certain distinctive class of work there. Many expert witnesses were called on either side, but the weight of evidence was overwhelmingly in favour of the new premises, so that in addition to the temporary loss of prestige, the photographer had to face a heavy bill of costs. Here the whole thing in a nutshell was that the particular style of lighting was one which came easily in the old premises, but the photographer imagined it to be due alone to his own skill and taste, and, failing to reproduce it, blamed the new studio. Such extreme cases rarely occur, but in a lesser degree the trouble is fairly common, especially with those who have not had the advantage of working as assistants in various studios before starting on their own account. Nowadays studios are not planned with the uniformity that formerly prevailed, when only a few daring spirits would venture upon any place which had not a full northern aspect, so that we must be prepared to make the best of any point of the compass, and with a little intelligent consideration this is not so difficult as it might appear.

If possible, it is a good plan for the newcomer to study the work of his predecessor, so as to ascertain what class of lighting had actually been produced. This will often give encouragement, and in all cases will be instructive. As an instance I may mention a studio with a top light only in which most excellent work had been done, but which the newcomer quite failed to equal. I was invited to visit it, and found that an alteration had been made which had destroyed all chance of good lighting. The studio was originally very wide, so that by placing the sitter well to one side the light fell obliquely upon the figure and obviated the top light effect. My friend had decided that the studio was unnecessarily wide, and had cut off nearly one-half to form dressing-rooms and a negative store, with the result that he was left with a comparatively narrow top light which practically defied control. In another case the new tenant did not care for his predecessor's work, and sought to improve upon it. This was easily done by removing some boarding which had been placed over the most useful part of the roof.

The man who moves into a north-light studio will usually find all plain sailing, but if he moves from such a studio to one where the sun is upon the glass for the greater part of the day, considerable modifications of his procedure will be necessary. Here clean thin white blinds or curtains must be used to cover what would be clear glass in his old studio, and it will probably also be advantageous to be able to change working ends at different times of the day.

Difference in height of the studio will sometimes cause a little difficulty in obtaining certain effects of lighting. In a low-roofed studio a slight change of the blinds causes a much more decided effect than it would in a high-roofed one; in the latter case portable head or side screens may be needed to produce the desired result. The nature of the glazing is also an important factor. Ground glass gives a uniformly soft effect, and is more in place in a southern or western aspect than in a northern one, where it will tend to produce flatness. It is often very beneficial to replace three or four breadths of ground glass by clear, which will give more sparkle in dull weather. Rolled or ribbed glass is much better than ground, as it diffuses the light without intercepting any, and does not give so much glare if the sun strikes upon it. Little difference in working will be noticed as compared with clear glass, while of course it prevents overlooking as effectively as ground glass.

The photographer who takes over a studio should not accept matters as they stand, but endeavour to make the working conditions as nearly like those to which he has been accustomed as possible. As a rule, a good clean-up of glass and blinds is necessary, and the sooner this is done the better. A general renovation of studio, reception and dressing rooms is calculated to make a good impression upon both old and new customers, who are not slow to notice these things, though they may say nothing at the time.

When taking over a going concern, the nature of the former proprietor's *clientèle* must be carefully studied and the greatest care taken to avoid offending them. In West-end studios the type does not vary much, but in provincial towns and in many suburbs the connection may be mainly among members of a certain denomination, and a change of proprietorship such as I have known, from an Anglican sidesman to a sporting freethinker, is likely to cause a large number of secessions, whose places have to be filled by a new class who consider only the pictures and not the producer. For the same reason it is not wise to sweep away all the old styles until it is certain that customers prefer the new ones, although it is very desirable to educate sitters into an appreciation of better-class work. We are all naturally more or less critical, except concerning our own business and our own productions. In taking over a studio we should be critical of the work and the style of business as it stands. In some respects we may find that the old proprietor knew more than we do, and in such cases his example should be followed, and any improvements which suggest themselves added. For example, if he was dilatory in sending out proofs and finished work, a special effort should be made to expedite delivery. If he was inclined to be disagreeable over re-sittings, we must be more obliging. These, of course, are the commonplaces of retail business methods, but photographers are not always alive to them. As far as the staff is concerned, I am rather inclined to advise following the example of the clergy and the licensed victuallers. In both these "industries" it is usual for the incomer to bring a new staff with him—curates or barmaids, as the case may be. There is nothing which hampers a business man so badly as to have a staff which thinks it knows how to run his business better than he does, and it is best to get the matter over before taking possession.

In the case of taking over a business as it stands, a careful inventory of the articles included in the sale should be demanded before any money is paid. I mention this because of a case which once came under my notice where many articles of furniture and some apparatus was removed by the original proprietor on the plea that they were not his own property, but lent by a relative. In such circumstances the purchaser has either to grin and bear the loss or to resort to legal proceedings, while if the ownership had been clearly defined before any payment was made, a deduction could have been claimed if deemed equitable.

A word of advice to assistants. I have pointed out the advantage the assistant who becomes a proprietor possesses over the ex-amateur who buys a business without studio experience, but it rests with the assistant to make use of his opportunities. He should not be content with merely making such sittings as may come his way, by using his employer's "stock lighting," but should endeavour to find out the capabilities of the studio for himself. Years ago there was often great jealousy between employers and their helpers, but I am glad to say that this is in a fair way to disappear, and most photographers are now willing to help their assistants to improve their work. In more than one case this attitude proved to be the salvation of the business when the employer was called up for active service.

PRACTICUS.

MAKING MONEY WITH A MOTION-PICTURE CAMERA.

The ambitious young man or woman determined to break into the studios as a motion-picture photographer will find his or her progress barred by the fact that the number of staff camera operators is necessarily limited. The ranks are already overcrowded, and unless you have a whole string of successes to your credit, your only chance of attaining your ambition lies in working your way through the film factory.

But there is nothing like the school of experience as a means of ultimately becoming skilled in this particular kind of work—work that is as exacting as it is fascinating. You don't need to possess unlimited capital to enter the field as a free-lance, though, of course, the more money you have at your command the more you can accomplish.

The free-lance cinematographer, no matter whether he resides in a small town or a large city, need not complain of the lack of opportunities which lie at his very door. I will dwell briefly upon the principal ways of turning the motion-picture camera to profitable account.

The latest development is film-motion portraiture. Were you to be "registered" before the exacting lens of the motion-picture camera for eight minutes, no less than 7,680 separate portraits would be taken at the rate of sixteen a second. Each portrait would be a momentary record of the sitter's face, and not one facial expression would be lost. On the screen you would be under the eye of the spectator for eight minutes. Each of the 7,680 photographs would not be a good likeness, but it would be the whole number projected in rapid succession that would give the faithful picture.

You can retouch and fake a photograph to suit, but you cannot tamper with a film. In fact, the only way is to do the faking beforehand by making up, and this does not always convince.

Who would not like to have a permanent record of all the quaint expressions that make a baby so adorable? They are lost to us as he grows older, but if he were to pose on every birthday we would be able to follow every stage of his childhood, and present the precious strip of celluloid as an appropriate coming-of-age gift. S. H. Lifshey, a Brooklyn, New York, photographer, makes a speciality of filming children in action, and brings out their pleasing characteristics. He also shows them at play with their pets and their favourite pastimes. Children are born photo-play actors, consequently they require comparatively little coaching.

A wedding occurs once, and it was left to a Frenchman to advertise something better than a group photograph. "Nuptial Cinema.—To Engaged Persons," runs the advertisement. "Do you wish to preserve a vivid, living recollection of the happiest day of your life? Have a film photographed of the ceremony (civic or religious) of your wedding, and in after years you will be able to see yourselves on the screen—young, loving, full of hope for the future."

One couple I know who married in 1909 permit their wedding movie to repose in the bank, only taking it out on each anniversary for their benefit and that of loving friends.

Other occasions on which motion-picture films might be taken are birthdays, vacations, and other family gatherings. By making a practice of recording such events, we should find many faults in ourselves which we did not believe before existed. We would also be able to correct these manners in deportment, speech and dress, and improve ourselves socially as well as in a business way.

Go to the local manufacturing factory and offer, for a fair consideration, to record on celluloid the manufacturing side of the products, the size of the plant, how admirably situated it is, and how the welfare of the employees is studied. You can, perhaps, weave a little story around the whole. Suppose the article is machinery of some kind. The manufacturer's salesmen cannot take samples to the prospect's office or factory, and it is difficult to have his product shown at conventions, trade shows, or similar gatherings of men whom he desires to interest in his product. Until recently salesmen depended upon their selling ability, aided by photographs, drawings, and data in regard to their goods. Where the prospective customer wished to see a machine in operation it was customary for the manufacturer to pay his travelling expenses to visit the plant, but this practice proved exceedingly expensive, and often took much, if not all, of the profit from the deal. The modern method is to have the salesman provided with a reel for demonstrative purposes. The salesman is equipped with a small portable projecting machine with which to show the reel, and in this way he is able to show his client all he wants to see, with the satisfaction to all concerned.

The estate agent can find no more effective way of selling property and lots than by the film. He saves the prospect much time and money, and gains his goodwill by not sending him on a fruitless journey.

City boosters need not compel people to imagine what they have to offer; the undeveloped territory or pleasure resort shown on the screen speaks for itself.

Societies in need for funds and other assistance can secure a better response to their appeals by acquainting the photo-play-going public with the good work they are doing.

Shopkeepers in a fairly large way of business will find a short, local comedy or dramatic photo-play a big business bringer. The above methods have been tried and proved, so you should find it much easier to obtain assignments.

How about forming an amateur photo-play society? When you come to think of the millions who attend the movies, it is surprising how few enthusiasts have combined to produce a simple local comedy or drama. All I can assume is that they have considered the amateur photo-play society far beyond the bounds of practical possibility. They have made a grave mistake in adopting this attitude, for, in proportion to the results attained, it is little or no more expensive than is dabbling at ordinary photography on a moderate scale.

Those with acting ability can figure in the cast, while the member possessing the most dramatic aptitude should be made the director. The talented weaver of stories would be the right man for scenario editor, provided he studied a book on photo-play writing and mastered the technique of photo-play construction. Last, but by no means least, you should do justice to the position of the camera-man.

If you can get the local photo-play shows to run your local productions, it will be a feather in your cap, but you may prefer to set up business on your own account. After having completed your first production, write all your friends and acquaintances, soliciting their support. Your own film-library will fit in like a glove, and you will not feel guilty of competing with the regular shows in your vicinity, and in this way you will be able to retain the friendship of the exhibitors and continue to supply their special needs.

You have, of course, the option of fixing your own territory, but I would recommend your not going beyond a radius of several miles. This will secure for your pictures a much more enthusiastic reception, because the spectators are especially

interested in local films, produced by local talent, amid scenes and things familiar to them.

Should you desire further clients, an advertisement in the local newspaper, setting forth the charms of a private motion-picture entertainment for social gatherings, clubs, societies, and lodges, will, no doubt, achieve the results for which you strive. Usually two pounds is charged for an hour's entertainment, comprising about four reels, and one pound for each additional hour. It is advisable to vary the films as much as possible, for it is variety on which the photo-play industry has been raised to its present prominent position.

Another field full of possibilities is in recording village pageants, local athletics, and the like. However good the printed page or photograph album may be in recalling the past, there is nothing to equal or excel, the motion-picture. The only way by which we learn history is through the historian's facile pen. Word-painting has its limitations, but the camera cannot lie. Who would not heartily enjoy our ancestors come to life again? Their quaint style of dress, the houses they lived in, and the customs that prevailed at the time would form a marked contrast to the way we live to-day. We should not think of the present, for when we have served our allotted span our successors will be as curious about us as we are about our ancestors.

Even to-day, when a well-known man or woman dies, his or her features have usually been caught by the motion-picture camera. The animated newspapers revive the scenes, proving how useful the motion-picture can be as a recorder of history.

Just because you live in a small town is no excuse for your not taking up topical work, for you are probably the only camera man in your own home town, and you are not up against the competition that prevails in the big cities.

The animated newspapers have correspondents stationed in most of the large cities, and in order to make a profitable connection you will probably have to give an exclusive option on your services, so far as the national field is concerned.

The news weeklies, circulating as they do from Land's End to John o' Groat's, want only negatives of national importance. A local fair, while of great importance to Sleepy Hollow folk, would not appeal at all to Londoners. So, before covering a subject, ask yourself whether it will appeal to people irrespective of their location.

Don't, whatever you do, develop the negative before shipping it, for the film editor likes to be assured he is getting exclusive stuff; besides, he has better developing facilities, taking this highly skilled work off your hands.

Local topical work—and by this I mean events covered for local exhibitors—is in some respects different. The progressive exhibitor realises that nothing attracts a full house and produces so much permanent advertising as a good topical reel.

I do not advocate taking local topicals on the off-chance. Put the proposition up to some exhibitor beforehand, and obtain a definite assignment. The greater the number of prints in circulation the cheaper you can rent them out. Many an exhibitor, while favourably disposed toward having the exclusive rights for their town, cannot pay the exclusive price. Their maximum is around fivepence a foot, which should yield you a fair profit if hired out to a string of theatres in your vicinity.

The educational is but a short step. At present it is in great demand as "filler" material, although if the interest of the subject warrants it it is put out as a separate reel.

In operating in a fairly large city, expose film on the principal thoroughfare, the largest public building, church, park, theatre, and places of historic interest, and any interesting industries.

Even if you do not intend giving home entertainments with your film library, you will need a projection machine in order to run each reel prior to public exhibition, for editing purposes. The miniature projector has a shorter throw, but it is easier to manipulate, and does not consume so much current, besides effecting a three-figure saving.

By taking up motion-picture photography first as a hobby, with the ultimate object of making it your vocation, there is no reason why you should not eventually become known as the "motion-picture man" of your town.

Ernest A. Dench.

PRICE POLICY IN COMMERCIAL PHOTOGRAPHY.

[The following notes by Mr. G. D. Crain, Jun., in "American Photography" cannot be said to apply in equal measure in this country, where undoubtedly more commercial photography is done for smaller business propositions than in the United States. Nevertheless, the argument underlying them, viz., that a low price does not necessarily attract a certain class of customer, is one deserving of consideration, since, broadly, the conditions under which photographs are taken for commercial purposes are the same in the two countries. The article will, at any rate, serve to give a hint to the men newly starting to offer first-rate commercial work not to err in the direction of cutting prices. The initial advantage is problematical, and such prices may afterwards be a serious handicap.—Eds. "B.J."]

A good many commercial photographers to whom the writer has talked in the last few months have the idea that while they are entitled to a good deal more money in the way of net profits than they are actually able to get, conditions in their field are so peculiar that it is out of the question to attempt to collect it. "The labourer and his hire," in their opinion, is a pretty theory which is entirely smashed in conflict with the practical conditions under which the photographer who is specialising in the business field is compelled to work. Consequently the average member of the trade is eking out an existence, paying most of his bills, and hustling like the mischief to collect outstanding accounts, while his line of credit at the supply house is generally strained to the breaking point. In other words, he is a good fellow and an excellent artisan when it comes to making pictures, but as a business man he is a colossal joke. That is, he would be a joke if he did not present such a pathetic figure in the business world.

The purpose of this article is not simply to criticise commercial photographers for not getting as much money as they are entitled to for their work. Most of them agree with the idea, but simply fail in carrying it out. The object is to suggest that they are starting with the wrong premise, and are assuming something that isn't so—namely, that customers are not willing to pay for good work.

Not long ago the writer was in the office of a big furniture manufacturer. This man does a business of hundreds of thousands of dollars a year. He brings out new designs twice a year, and these have to be photographed and included in his catalogue, for the use of salesmen and merchants who handle his line. He displayed some of the new photographs which had just been made.

"Who took these?" he was asked.

The furniture man named a photographer in a city several hundred miles from his own, which, by the way, contains at least three photographers who could have handled that work very nicely.

"It cost a good deal to bring an outsider here and have him do the work," it was suggested. "Why didn't you have Blank, here in town, do the work?"

"Oh," said the manufacturer, carelessly, "these local photographers are too cheap. They are hardly up to this sort of thing. The other fellow certainly knows how to charge for his work—I just paid the bill!—but he delivers the goods on photographs."

Without stopping to debate the question of the value of specialisation, and hence the development of a reputation for being able to do a certain thing superlatively well, it is clear that in this case the local men had "queered" their own game by making a charge which was too far below that of their high-grade competitors in other cities to suggest that the quality of their work could possibly approximate what was wanted.

As the buyer of supplies in a certain big factory said not long ago, "In purchasing goods I seldom consider the low man, if he is very far out of line. I know that either he is not going to deliver the goods, and we will have trouble through the necessity of having to reject it, delaying us and causing him loss, or he will come out in the hole and be dissatisfied with the business. We want everybody who deals with us to make a legitimate profit, so that he can stay in business, give us just what we order, and find it worth while to go out of his way to give us service."

That is the modern way of doing things: not buying the very cheapest to be had, but seeking to combine service and quality in the right proportions by being willing to pay the price which these things command in the open market.

Photographs, especially those that are intended to serve a specific commercial purpose, lend themselves especially to the development of quality business, for the reason that the professional element enters into the proposition, and the customer can appreciate the fact that exceptional talent must be paid for accordingly. The photographer who would get a reputation for turning out good work, conversely, must learn how to charge a good price. The two go together, in most cases, and the average buyer has learned that he usually gets just about what he pays for.

The commercial artist who is doing a job at a price which barely allows a profit, but one which can be seen only with the aid of a high-power microscope, is going to try to cut the corners at every stage of the game. He has no choice in the matter. If he lost money on every order he would soon kick himself out of his job, and consequently the low-price work must be done at correspondingly low cost. Instead of taking a time exposure, even where it is desirable, he will make a flashlight out of it and beat it to the next job. Hurry-up methods in development and printing will be employed, in which quality may get some consideration, but probably not much. He will get out a photograph that will show the things that were to have been shown, in most cases, but which could have been improved upon vastly if more time had been taken.

That is "commercial" work in its worst sense. It is work which is obviously done just to get the money, and which, for that very reason, doesn't get the money in the amount which is gladly paid for photographic products which show thought and care and time-consuming painstaking—in other words, the professional, artistic aspect of the proposition.

The Elbert Hubbard—alias Emerson—sentence about the world beating a path to the hut of the man in the woods, if he makes a particularly good line of mousetraps, is mostly bunkum, but it contains a truth at that. Good work makes friends for itself and builds customers for the worker, but the live advertiser, who doesn't stop with publicity, but goes further and turns out quality products, is the man who will get the business and earn the profits while the chap in the backwoods will have been compelled to adopt a policy of watchful waiting for the customers who don't show up.

Yet, on the other hand, there is a certain commercial photographer who is of the type suggested by Fra Elbertus. He doesn't live in the woods, but in a large city. However, he has adopted the backwoods idea in his business methods, having a poorly located shop, no telephones, and being generally difficult of access. Yet he gets some business, has a lot of customers who would rather have him do their work than anybody else, and in a small way has established a fine reputation. The other commercial photographers in his community laugh at him because of his lack of aggressiveness, and yet they admire him because of his willingness to spend unlimited time in getting the correct results. On the one hand, he limits his capacity for getting business by his passive methods, and on the other he binds his customers with hoops of steel by turning out the sort of photographs that will help to sell goods.

The slap-bang system of doing work, coupled with keen business-getting ability and aggressive methods, will probably produce a reasonable degree of success, and a modest place can be won by the photographer who is so absorbed in his work that he forgets that he is in business to make money. But the palm must go to the man who combines business-getting, hustling ability with real quality methods, because that is the sort of photographer who will be able to get the prices that carry real profits.

Gouverneur Morris recently had a story in one of the popular magazines about several very alluring young women who, when fortune turned against them, converted their country place into a summer boarding establishment. In advertising it they decided to make it a bit exclusive, and to appeal to those who could afford to pay enough to make the game worth the candle. Consequently, one of the features of the announcement was, "Prices Rather High." The story told of the success of the plan, and of the very attractive and altogether eligible men who turned up in response to it, as well as the appeal of the photographs of the charming young women. The obvious moral for business men, including photographers who have become inoculated with the idea that they can't get the right amount for their work, is that there is a market which is appealed to by the announcement of prices higher than ordinary, because such an announcement connotes service out of the ordinary.

A great many people who have resources enough to be able to pay for anything they happen to want skip the bargains and are not classed among the bargain-hunters; and the man who wants to get their trade must get it by demonstrating that he has the goods, and that he is in a position to perform a professional service which is beyond the capacity of the rank and file.

The successful business establishment which is using photographs in its work wants good photographs. In spite of the beliefs of many photographers, it is willing to pay what they are worth. But it must first be convinced, by any individual solicitor, that he can really make the sort of pictures that are needed. After that kind of demonstration the prices will take care of themselves.

G. D. Chain, Junr.

Death of Mr. J. T. Chaffin.—The death occurred at his home, 6 Hendford, Yeovil, on November 2, of an old and respected townsman in the person of Mr. John Tarver Chaffin, who for a long period of years had conducted a photographic studio. Mr. Chaffin, who died from heart failure, was sixty-three years of age. His father, the late Mr. John Chaffin, studied photography in Paris, and on his return in 1862 opened a photographic studio at 6, Hendford. The son, after the death of his father in 1885, successfully carried on the business, took a great delight in his work, and won many honours both at home and abroad.

TRADE MARKS IN CHINA.

The growth of trade in photographic goods which the last few years have witnessed in the Far East, and especially in China, have brought to the notice of European manufacturers and merchants the difficulties which are encountered through the infringement of European trade marks in Eastern countries. In view of the complex legal conditions which prevail, we are quite sure that we are doing some service to the many firms in the photographic and allied trades by reprinting a most lucid and comprehensive exposition of the question, which takes the form of a paper read before the Shanghai Advertising Club of China by Mr. W. B. Kennett, of the British and American Tobacco Company (China), Limited, and a member of the Trade-Marks Sub-Committee of the Shanghai Chamber of Commerce, and published in the Chamber's "Journal." At the same time that this paper reached us there was also published in the "Board of Trade Journal" an abstract of a pamphlet of American origin dealing with almost the same questions as have engaged the attention of the Shanghai Club. We may therefore preface Mr. Kennett's paper by these notes.

An instructive pamphlet has recently been issued by a New York attorney, who has made a study of the trade-marks situation. He states that American manufacturers and traders must, for safety, seek carefully to observe certain rules if they wish to succeed in the export business. These rules are outlined as follows (and the advice given might be accepted by British firms) :—

(1) They must register each and every trade-mark used by them upon their goods, in their own name, and in every country in which the goods are sold.

(2) Register the trade-marks before the goods are shipped abroad, and, if possible, before the marks are advertised in trade journals which will reach foreign countries.

(3) Where the same mark is used, or likely to be used, upon different articles of the same general class make certain that the registration covers all such articles.

(4) Where the same mark is used upon articles which are found in different classes, effect a separate registration for each distinct class.

The dangers of piracy, he states, may be classified chiefly as follows :—

1. *Actual Piracy.*—The registration by a foreigner of an unprotected, well-known, and valuable trade-mark, to the prejudice of the real owner who has neglected to protect his property. There are a great number of instances of this nature, and in most cases the real owner has been obliged to cease using his own mark in such country, or acquire the right to the use thereof from the registrant.

2. *Imitation and Counterfeiting.*—A trade-mark owner who neglects to register his marks abroad frequently finds his market flooded with inferior goods bearing imitations or counterfeits of his name or marks.

3. *Registration in Name of Local Agents.*—This is a frequent cause of trouble and expense in cases where disagreements have arisen, or new agents have been selected, as the mark is the property of the agent in whose name it was registered.

4. *Registration of Marks.*—Owners who allow the term for which a registration has been effected to expire without procuring a registration sometimes find that an unscrupulous trader has stepped in and secured the registration of the mark in his own name. This occasions serious loss in cases where marks have become well known and valuable through long use.

MR. KENNETT'S PAPER.

The subject of trade-marks is anywhere a very difficult and technical subject, and it must be particularly so in relation to China, where foreign nations have the privileges of extra-territoriality, and where so many different nationalities and systems of law are represented. The most I can hope to do is to give some general outline of the subject, and indicate some of the difficulties which have to be overcome in obtaining proper protection for trade marks in China.

Trade-Marks in General.

I will deal first with trade-marks, and will endeavour to give a definition of what a trade-mark is. Here I am, for the present, dealing with the broad principles of law which are in England called the "Common Law," that is to say, the law as apart from the specific law embodied in statutes.

An eminent English judge, Vice-Chancellor Bacon, described the general principles on which protection should be given to trade-marks as follows :—

"A manufacturer who produces an article of merchandise which he announces as one of public utility, and who places upon it a mark by which it is distinguished from all other articles of a similar kind, with the intention that it may be known to be of his manufacture, becomes the exclusive owner of that which is henceforth called his trade-mark. By the law of this country—and the like law prevails in most other civilised countries—he obtains a property in the mark which he so affixes to his goods. The property thus acquired by the manufacturer, like all other property, is under the protection of the law, and for the invasion of the right of the owner of such property the law affords a remedy similar in all respects to that by which the possession and enjoyment of all property is secured to the owners."

Another English judge used these words :—

"A man is not to sell his own goods under the pretence that they are the goods of another man; he cannot be permitted to practise such a deception, nor to use the means which contribute to that end. He cannot, therefore, be allowed to use names, marks, letters, or other indicia by which he may induce purchasers to believe that the goods which he is selling are the manufacture of another person."

It will be seen, therefore, that a trade-mark has two principal functions :—

1.—To secure to the manufacturer the benefit of the goodwill which he creates in respect of an article, or brand of goods, which pleases the consumer and thus secures a large sale, and

2.—To secure to the consumer the right to obtain the goods he wants. It is on the faith of the trade-mark that the purchaser makes his purchase. The trade-mark means "You may take this mark as a warranty that this article is the same as that you have heretofore purchased, which has given you satisfaction."

It follows that apart from any question of registration of a mark, the law should, from the point of view of both the manufacturer and the consumer, prevent unscrupulous traders from copying or imitating trade-marks, for such conduct amounts to a fraud injuring both the manufacturer and the public; for it may be assumed that the public will in such cases be injured, as it is hardly likely that a manufacturer who is honest enough and capable enough to make goods of good quality would wish, or would consider it necessary, to put another trader's mark upon his goods in order to secure a sale for them.

I may mention here that a trade-mark does not necessarily mean that the goods on which it is used are goods manufactured by the proprietor of that mark. The person who selects or certifies goods may apply a trade-mark to them as a means of showing that he has selected or certified them, and he is entitled to have his mark protected just as a manufacturer is entitled to have his mark protected. The English Trade Marks Act of 1905 defines a trade-mark as follows :—

"A trade-mark shall mean a mark used upon or in connection with goods for the purposes of indicating that they are the goods of the proprietor of such trade-mark by virtue of manufacture, selection, certification, dealing with, or offering for sale."

I have pointed out that a trade-mark is for the protection of the public as much as the owner of the trade-mark, and from this follows the consequence that, according to English law, a trade-mark

may not be assigned except with the goodwill of the business connected therewith; that is to say, a manufacturer who has used a particular trade-mark for, say, a brand of meat extract, cannot assign that trade-mark apart from the goodwill of the business in such meat extract; if he did so the public might be misled into buying an entirely different product on the faith of the trade-mark. So far as registered trade-marks in England are concerned, a transfer of a mark without the goodwill of the business connected therewith cannot be made on the register of trade-marks, and if the mark were an unregistered mark, I take it that the effect of attempting to assign the mark without the goodwill of the business connected therewith would be to make the mark a "Common mark" in respect of which no protection could be claimed.

Passing-off Cases

There is one class of cases which requires mention in connection with the general principles on which trade-marks are protected—that is to say, what are usually known as "passing off" cases. In these cases an actual trade-mark in the sense of a particular design or device, such as would be capable of registration as a trade-mark, is not necessarily imitated, but by general get up of the package in respect of similarity of size, colour, position of printed matter, style of type, and so forth, the package is made to look so much like the package in which another manufacturer's goods are sold, that an unwary or illiterate purchaser might be deceived. In short, the goods are so got up as to enable them to be "passed off" as another manufacturer's goods. Such cases are governed by substantially the same principles as those relating to trade-marks proper—that is to say, the law will restrain such abuses both in the interests of the original manufacturer and of the public.

Trade-Marks in China

I will now pass on to consider trade-marks in China, and particularly trade-marks used by foreigners in China. We will assume that a British merchant carrying on business in China owns a valuable trade-mark which he has used in China for many years, and we will consider the risks of infringements which he runs, and the remedy which he has in each case.

There are three main classes of traders who may infringe the British merchant's trade mark:—

1st, other Britishers.
2nd, foreigners other than Britishers.
3rd, Chinese.

With regard to the first class, infringement by traders of the same nationality as the owner of the trade-mark, there is no great difficulty, for, if a Britisher in China infringes another Britisher's mark, or passes off his own goods as other people's, the injured merchant can take action against the offender in the British Court, and will have practically the same remedies as he would in England. I assume the position would be the same in the case of an American citizen bringing an action against another American citizen in the United States Court, or a Frenchman bringing an action against another Frenchman in the French Court.

Reciprocal Agreements Between the Great Powers.

With regard to the second class—namely, infringement by a foreigner of another nationality, certain of the Great Powers have entered into special arrangements between themselves, whereby each nation agrees to give protection against infringement, by its own nationals, of the trade-marks of the nationals of the other nation used in China. Great Britain has entered into reciprocal arrangements of this nature with Belgium, Denmark, France, Germany, Italy, the Netherlands, Portugal, Russia and the United States respectively. These agreements were carried out by the exchange of Notes between the respective nations mentioned, made in the years 1903 to 1906.

The condition on which protection is given is, the mark for which protection is sought must be registered in the country from the courts of which in China protection is sought. Thus, if a British subject seeks protection in the American Courts here against infringements of his trade-mark by an American citizen in China, he must show that he has registered his trade-mark in the United States, while an American citizen seeking protection in the British Court against infringement of his mark by a Britisher in China must show that he has registered the mark in the United Kingdom. This arrangement is somewhat unsatisfactory, because it practically compels a foreign trader in China to register his mark in all the countries named, in order to obtain the most complete protection he can in China.

Infringement by Japanese.

You may have observed that Japan was not among the countries named as having entered into reciprocal agreements with Great Britain for the protection of trade-marks in China. There is no such agreement between Great Britain and Japan. It is generally understood that Japan was approached with a view to entering into a similar agreement, but that she declined to do so. A very interesting question arises in this connection—although Japan did not make a reciprocal agreement with Great Britain, she did make such an agreement with the United States by the Treaty of 1908. The particular provisions of this Treaty are as follows:—

Article 1.—Inventions, designs and trade-marks, duly patented or registered by subjects or citizens of one High Contracting Party in the appropriate office of the other Contracting Party shall have in all parts of China the same protection against infringement by subjects or citizens of such other Contracting Party as in the dominions of such other contracting party.

Article 3.—In case of infringement in China by a subject or citizen of one of the two High Contracting Parties of any invention, design, trade-mark or copyright entitled to protection in virtue of this convention, the aggrieved party shall have in the competent territorial or consular courts of such Contracting Party the same rights and remedies as subjects or citizens of such Contracting Party.

Now, in the Treaty of Commerce and Navigation between Great Britain and Japan entered into in 1894, there is the following clause:—

The High Contracting Parties agree that, in all that concerns commerce and navigation, any privilege, favour or immunity which either contracting party has actually granted, or may hereafter grant, to the Government, ships, subjects or citizens of any other State, shall be extended immediately and unconditionally to the Government, ships, subjects or citizens of the other Contracting Party; it being their intention that the trade and navigation of each country shall be placed in all respects by the other on the footing of the most favoured nation.

The question is, whether the effect of this clause is to give to British merchants in China the same protection and rights against infringement of their marks by Japanese as American merchants would have in similar circumstances. It will be observed that the article of the Treaty says, "in all that concerns commerce" any privilege granted to the citizens of any State shall be immediately and unconditionally extended to subjects of Great Britain. The protection of trade-marks is surely a matter of commerce, and it may, therefore, well be argued that, notwithstanding the fact that there is no express reciprocal agreement between Great Britain and Japan as to the protection of trade-marks in China, British merchants, by virtue of the "most favoured nation" clause above quoted, nevertheless have exactly the same rights in this respect as American merchants have under the above quoted Treaty. It is a very interesting point, and it might possibly be worth while attempting to get protection upon this basis in the case of persistent infringement of a British merchant's mark by Japanese.

There is another method by which foreigners in China may get partial protection against Japanese infringements: that is, by registering their marks in Japan. Such registration would entitle them to stop the manufacture of goods bearing an infringing mark in Japan for export to China, although it might not stop the production of goods bearing an infringing mark by Japanese in China.

There is yet another method by which trade-mark owners in China may sometimes get protection in respect of any extensive sale in China of goods got up in imitation of their goods and manufactured by Japanese—that is to say, by taking proceedings against any Chinese dealer who sells such goods. Naturally, wherever it is possible, one likes to attack an evil at its source, and no one would willingly take proceedings against a shopkeeper for selling offending goods if he could find and take proceedings

against the manufacturer; but where the manufacturer cannot be found, or where by reason of his nationality proceedings cannot be taken against him, it is sometimes necessary to take proceedings against the man who actually sells the goods, and an injunction can be obtained against him, which will serve as a warning to him and to all other retailers to avoid dealing in imitation goods.

Infringements by Chinese.

I will now deal with the third class of infringement—namely, infringement by Chinese :—

By the Treaty made between Great Britain and China in 1902, the Chinese Government undertook to afford protection to British trade-marks against infringement or imitation by Chinese subjects. The Chinese Government further undertook that offices should be established under the control of the Maritime Customs, where foreign trade-marks might be registered on payment of a reasonable fee. By the Treaty with Japan of 1903 China is bound "to make and faithfully enforce such regulations as are necessary for preventing Chinese subjects from infringing registered trade-marks held by Japanese subjects." Of course, all foreign nations enjoying extra-territoriality and the benefit of "the most favoured nation" clause as to agreements with China are entitled to the same privileges and protection.

Some years ago there was established at the Customs Office in Shanghai a Bureau for Provisional Registration of Trade Marks, but it cannot be said that anything in the nature of a registration of trade-marks has been established, for the Bureau simply accepts for filing any trade-mark, or alleged trade-mark, which is presented, and there is no investigation, advertisement or other procedure which notifies the public that an application has been made to register the proposed mark, or gives interested traders the right to object, such as is in force wherever there is a proper system of registering trade-marks. In fact, the Bureau simply files trade-marks which are presented to it, and such filing cannot, obviously, give the merchant who files the mark the title to it, as there may be many conflicting marks already in existence and even on the file, which would prevent registration if the usual procedure of examination and advertisement took place.

Nevertheless, although there is no proper registration of trade-marks in China, foreign traders are not entirely without remedy in case of infringement of their marks or imitation of their packages by Chinese. I have already endeavoured to explain that the "passing off" of goods as those of another manufacturer is a species of fraud, which, apart from any statutory enactment, is so contrary to public welfare that in any country having a system of law it will be restrained on general principles. I presume these principles would apply in any court in China, and they certainly are applied in the Mixed Courts in the Foreign Settlements where, naturally, most of such cases are likely to be dealt with.

Mixed Court Cases.

There have been two recent trade-mark cases in the Mixed Court in Shanghai. One very interesting case was that brought by Messrs. Burroughs Wellcome and Company against the Nanyang Medical Company in respect of the sale of goods got up in close imitation of the plaintiff's well-known toilet article called "Hazeline Snow." That was a case where the shape and design of the package, the colouring of the design, the position of the printed matter, and the method of packing made it clear that the article produced by the defendants was got up in the way it was for the purpose of enabling it to be "passed off" on an unwary purchaser as the plaintiff's well-known article. There were, of course, minor differences in the packages, as there usually are in such cases, but it would be impossible for anyone comparing the two packages to have any doubt in his mind that the defendant's package was produced by someone having before him the plaintiff's package, and intending to produce a package so like the plaintiff's package as to enable the imitation goods to be passed off on an unwary purchaser as the original production. In this case the court granted an injunction against the defendants, and ordered delivery to the plaintiffs of all the imitation goods in the defendant's possession, and an account of all the profits the defendants had made by selling the imitation goods. You will see, therefore, that the penalty for conduct of this sort is a substantial one, and it is to be hoped that this case will have a deterrent effect upon other producers of imitation goods.

Another case recently before the Mixed Court in Shanghai was that of Messrs. A. R. Burkill and Sons against Shun Tah, in respect of the sale of soap got up in such a manner as to enable it to be passed off for a soap manufactured by W. Gossage and Sons, Ltd., for which the plaintiffs are agents in China. This was one of the cases in which the proceedings were taken against the retailer, as it was apparently impossible to ascertain who was the manufacturer, or to bring him before the court. The court was satisfied that the soap was so get up as to enable it to be passed off as the soap sold by the plaintiffs, and an injunction was granted prohibiting defendants selling the soap for the future.

Both these cases were civil cases. It is also possible to take criminal proceedings in the case of deliberate manufacture and sale of counterfeit goods. Within the last three years convictions have been obtained in several cases where cigarette wrappings, including the manufacturer's name, were counterfeited in the most deliberate and complete manner.

It will be seen from the cases that I have quoted that foreigners are not entirely without remedy in the case of imitation of their marks or packings by Chinese, and that the undertaking given by the Chinese Government to Foreign Powers as to protection of trade-marks belonging to their subjects in China is, to some extent, carried out. The undertaking, however, cannot be properly and completely carried out, nor can full protection be given to trade-marks in China, until a trade-mark law has been promulgated by the Chinese Government with the consent of the Foreign Treaty Powers, which law should provide a proper register for trade-marks, in which both Chinese and foreigners can register their marks. It is obvious that, as extra-territoriality exists in China, such a law can only be promulgated and made binding upon foreigners as well as Chinese, if the various foreign governments concerned agree upon the draft law.

During the past twelve or fourteen years this question has been brought up for consideration from time to time, but no scheme acceptable to all the Foreign Powers has yet been produced. The blame, therefore, for the lack of a proper trade-mark law cannot be put upon the Chinese. There are many difficult questions which will have to be settled in connection with the proposed law, of which the principal one is the question as to the right of registration where there are rival claimants for registration of the same mark or of conflicting marks. It is obvious that the filing of a mark at the Bureau for the Provisional Registration of Trade Marks, which I have mentioned, cannot be regarded as giving the person who filed it the right to the mark, because, possibly, he had no right at all to file it, and he may have deliberately filed it, knowing that it belonged to another. In fact, it is believed that, at the time the Bureau was opened, large numbers of well-known marks were filed by persons having no right whatever to them. It is obvious that such persons cannot be given rights by reason of such unjustifiable action.

I think that probably most of us will agree that the fair and proper test should be priority of *bonâ-fide* user of the mark in China; but the user must be *bonâ-fide* user, and in cases where trader has taken some well-known mark, used extensively, for example, in the United States, and has put out goods under such mark without having any right whatever to do so, he ought not to be entitled to obtain rights to such mark in China so as to prevent the original owner of the mark abroad from sending goods here unless he—that is the trader who has used the mark in China—can show that he has used it for a long period, without protest or objection; if he can show this, and can show that he has used the mark in a substantial and open way, then he may be entitled to have the mark registered, as it may be assumed that the original owner of the mark abroad has no wish or intention to use the mark here in China. In fact, to put the whole thing into a few words, it is *bona-fide* user which should be the test, not improper user.

Although, therefore, there are difficulties in formulating a law which will be acceptable to China and to all the nations concerned, these difficulties, I think, are not insuperable if they are approached in a reasonable way, with a view to meeting an urgent necessity, and not with a view to giving any one nation an unfair advantage over another.

It should be in the interests of every nation represented here

in China to have put into force a proper system of registration of trade-marks and enforcement of protection to trade-mark owners, such as is usually given in civilised countries. We know that the condition of things existing at present gives the nationals of one nation unusual opportunities to imitate trade-marks with comparative impunity, but I cannot think that such an advantage can do any real good to that nation in the long run. After all, the imitation of a trade-mark, or the packing of the goods of another trader, is a mean business: it carries with it the confession of inferiority, because there is no need for a competent and honest manufacturer to endeavour to sell his goods as those of another manufacturer. Any nation whose subjects make a habit of this class of mal-practice must earn a reputation which, in the long run, cannot fail to outweigh any temporary advantage which some of its subjects may at present obtain by unscrupulous methods.

In the near future the question of a trade-mark law for China must again come up for consideration. I think that this time it must be definitely dealt with, for trade is extending in China and more trade-marks are getting into use almost daily. It is already high time that means to record rights to trade-marks was provided, for the longer the present state of things continues the more difficult will be the problems which will have to be dealt with when registration begins. We must hope that all nations concerned will take a large view of the position, and that none will let any private advantages or interests, not based on the broad and world-wide principles of commercial morality, stand in the way of reform and progress.

W. B. KENNETT.

New Apparatus, &c.

The British Anschutz Focal-Plane Camera. Made by Messrs. R. E. Peeling and S. Van Neck, 4-5, Holborn Circus, London, W.C.

As every Press photographer will confirm, a camera of ex-enemy manufacture which for many years before the war was the most popular instrument among pressmen was that known as the Anschutz, or, more commonly, as the Goerz-Anschutz, in reference also to the name of its maker. The camera was the pioneer among those of the focal-plane type, and undoubtedly retains its wide popularity among Press photographers owing to its general excellence of construction, and particularly the reliability of its shutter. Messrs. Peeling and Van Neck have, therefore, done a good thing in taking up the manufacture of this instrument, and in this connection deserve a word or two by way of introduction to the general photographic public, to whom perhaps they are not so well known as in trade photographic circles. Both are mechanicians of long and special training in photographic apparatus, one of them in pre-war days with the Goerz firm, and the other as an expert repairer of all descriptions of camera. Their association in offering photographers the Anschutz camera is, therefore, particularly fortunate, since together they embody an experience not merely of this instrument but of those weak points in focal-plane cameras which it is desirable to avoid. Thus the Anschutz camera has been issued with some modifications which remove one or two defects of the German-made instrument. For example, the back frame of the new camera is made of aluminium instead of the thin and easily breakable wood employed in the German model, and the front main panel is made without any division above and below, so that it affords the most secure holding of the extending struts. Moreover, the best mahogany has been used for the wood parts in place of the more brittle ebonised wood, and the pneumatic release of the shutter has been replaced by an Antinous fitting.

In the important matter of the shutter the British makers have quite rightly, as we think, adopted the ordinary instead of the self-capping type. Their experience, which no doubt most Press photographers will corroborate, is that the non-self-capping shutter, owing to its less complicated construction, is less liable to get out of order, and every user of the camera would certainly prefer extra reliability to the very problematical and infrequent advantage of self-capping. The shutter-blind is of the double-slit pattern, one slit being of fixed width, namely, the full width of the plate, and the other adjustable by a very simple movement applied to the blind itself. The wide slit is used for slower instantaneous speeds and for bulb and time exposures, the other serving for the most rapid exposures. The two slits are kept quite separate in use by a special catch, but one or the other is brought into operation by pressure on this catch from a stud placed on the left-hand side of the camera. With the adjustable slit set at a medium width, variation in the spring tension of the shutter thus allows of the operator giving exposures from 1/10th to 1/120th of a second without any alteration of the slit-width, the slower speeds being obtained with the fixed slit, and the more rapid ones with the narrower adjustable slit. Since such a range corresponds with the requirements of a large proportion of subjects, it may be said that alteration of the slit-width is necessary only for subjects of very rapid movement, such as sports, etc. Outside adjustment of the shutter to instantaneous (I) or bulb (B) is provided, and with the shutter at the "bulb" setting the exposure can, if desired, be begun by a sharp rapid touch on the release trigger, the blind then remaining open until the trigger is again pressed. In other words, the "bulb" setting provides for both "bulb" and "time" exposures. A further good feature of the shutter is the close mounting of the blind to the true focal-plane or surface of the plate. Particularly with rapid exposures (narrow slit), excessive separation of blind and plate greatly reduces efficiency of exposure. In the British Anschutz the blind appears to us to be as close as it is possible to put it in a plate camera.

In other respects the camera does not call for special comment, since its chief other features are those which have long been familiar to the users of the ex-enemy model. The English makers, however, are supplying it with plate-holders of the solid Shew pattern, in which two plates, back to back, with a separating card between them, are inserted at the base of the holder, the aperture in which is then closed by a rebated end-piece fitted with a spring. The device is one which facilitates rapid loading, and, moreover, holds the plates beyond any possibility of their slipping out of position.

The new camera is supplied with three of these slides and stout brown leather case at the price of £30 in 5 x 4 size, with 6-in. f/4.5 anastigmat. The makers have chosen the new model T.T. and H. "Aeroplan" anastigmat as the standard optical equipment, although there may be some delay in supplying this lens. Earlier deliveries of the Anschutz may, therefore, possibly be fitted with other lenses. The outfit is certainly one which, after the closest inspection of it, we can recommend to those requiring an instrument for Press or similar work

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

SATURDAY, NOVEMBER 15.

Manchester Amateur Photographic Society. "Happy Japan, Garden of Glitter." H. O. Allen.

MONDAY, NOVEMBER 17.

South London Photographic Society. "The Domestic Fly, its Habits, Structure and Menace to Health." Dr. G. H. Rodman.
Dewsbury Photographic Society. "More About Lantern Slides." H. Potter.
Widnes Photographic Society. "Home-Made Apparatus."
Bradford Photographic Society. Members' Print Night. Sale of Apparatus.

TUESDAY, NOVEMBER 18.

Royal Photographic Society. "The Story of the Cuckoo Spit." Dr. G. H. Rodman.
Hackney Photographic Society. Thames Pictures, from Negatives taken during 1919.
Chelsea Photographic Society. "Some of My Pictures." T. H. B. Scott.
South Glasgow Camera Club. Lantern Slide Competition and Lectettes.
Stalybridge Photographic and Scientific Society. "Demonstration on Enlarging." F. Whitaker.

WEDNESDAY, NOVEMBER 19.

Croydon Camera Club. "Algeria." Dr. C. A. Swan.
North Middlesex Photographic Society. "Ravdex." J. F. Nisbett.
Edinburgh Photographic Society. "Gum Bichromate Process." R. Thomson.
Dennistoun Amateur Photographic Association. Portraiture Competition.
Partick Camera Club. "Development of Plates and Films." F. V. Taylor.
South Suburban Photographic Society. "Noctona Gaslight Paper." C. W. Green.
Halifax Scientific Society. "Enlarged Negatives" from P.O.P. Prints. B. Wade.

THURSDAY, NOVEMBER 20.

Liverpool Amateur Photographic Association. "Cruise to the Western Fjords of Norway." Rev. R. B. de Wolf.
Hammersmith (Hampshire House) Photographic Society. A. P. Slides—Affiliation Slides.
The Camera Club. "The Spider—its Formation and Habits." Dr. G. H. Rodman.
Richmond Camera Club. "Carbon Printing." A. C. Braham.

Chelsea Photographic Society. "The Thames," with colour slides. J. McIntosh.
Brighouse Photographic and Naturalist Society. Y. P. U. Slides and Prints.
Aston Photographic Society. "Lantern Slide Making." W. F. Carter.
Wimbledon Camera Club. Demonstration, "Satista." T. W. Derrington.
Hull Photographic Society. "Round Yorkshire." Rev. W. Hay Fea.
Birmingham Photographic Society. Annual General Meeting.
Rodley and District Photographic Society. "Building the Picture." Messrs. Willey and Slater.

FRIDAY, NOVEMBER 21.

Royal Photographic Society. "Scorpions, Spiders, and their Kin." F. Martin-Duncan.
Dennistoun Amateur Photographic Association. "Development." R. Wallace.

THE ROYAL PHOTOGRAPHIC SOCIETY.

MEETING held Tuesday, November 11, the President, Dr. C. Atkin Swan, in the chair.

The President delivered his annual address to a very small audience. Armistice anniversary celebrations may perhaps have been the cause of the insignificant attendance of members, but it could not go unremarked that not one of the members of the council of the Society was present. Dr. Swan disclaimed any intention of making his address a learned disquisition upon some technical subject, but preferred to deal by way of retrospect and looking forward with a number of topics of general and specific interest to members of the Society. He briefly referred to the defeat of the enemy in the several branches of photographic manufacture, and turned to consider the programme which the Society had carried out during the session which comes to an end early next year. He said that the formation of the Scientific and Technical Group within the Society was a step which it was most necessary to make in order to deal with the study and advancement of the many special branches of photography which had come into existence during the past twenty years. Answering objections to the formation of such a Group which he had heard, he pointed out that the special work of the Group would be carried on by means of the extra subscription paid by Group members, and he was quite sure that there was no ground for dissension in the Society on any score. The formation of the Group had had his hearty support, and he hoped that it would also receive that of the general body of members.

On the proposition of Mr. John H. Gear, seconded by Mr. J. W. Lumb, the thanks of the meeting were heartily accorded to the President.

EDINBURGH SOCIETY OF PROFESSIONAL PHOTOGRAPHERS.

A MEETING was held at 116, Hanover Street, Edinburgh, on Monday, November 3, 1919, at 8 p.m. Present: Misses Grey, Eadington, D'Arcy, Messrs. E. Drummond Young, Johnston, Swan Watson, Laing, Norman Thomson, John Thomson, Campbell Harper, Fergusson, Philip, Moffat, Lauder, Bambrick, George Balmain, and Macalpine. Mr. E. Drummond Young in the chair.

Apologies for absence were intimated from Messrs. Ayton, Drummond Shiels, and Barrie.

The minutes of the last meeting were read and approved of.

The proposal to hold a professional photographers' exhibition in Edinburgh next year was discussed. The Chairman intimated that unless twelve members supported the proposal it could not be proceeded with, and in the meantime only nine had indicated their willingness to do so. The feeling of the meeting was that once the scheme was gone on with other members would co-operate, and it was accordingly resolved to continue the matter until the next meeting in December. In the meantime it was arranged to approach some of the other members and endeavour to secure their support.

Mr. Swan Watson reported that he had had an interview with Principal Laurie, of the Heriot-Watt College, in regard to the position of apprentices under the Scottish Education Act. The Principal had stated that the College had at present no equipment or apparatus for the technical teaching and training of photographers' apprentices, and that, in any event, the Act would not be in force until two years subsequent to a date to be fixed by Government. The meeting accordingly resolved to disregard the Act until it was made compulsory. The matter was recommitted to the committee to consider the terms of the proposed apprentice agreement, and to submit the same to the meeting of the society on January 5 next for approval and adoption.

The question of the charge for electricity power was next considered. It was pointed out that photographers in other towns, such as Glasgow and Carlisle, were charged a power rate for portraiture and printing, and it was considered that a similar concession should be obtained by photographers using electricity in Edinburgh. A letter addressed to Mr. Drummond Shiels by Mr. Hannah, of the town clerk's department, was read to the meeting, in which it was stated that a special rate of 3.15d. for the first 5,000 units per annum and thereafter 2¾d. per unit, with a minimum charge of £2, had already been conceded to photographers for printing process only. The feeling of the meeting was that the members using electricity had a grievance, and that some steps should be taken to remedy matters in view of the considerable amount of electricity consumed and the privileges held by photographers in other towns. The present time was, however, considered unsuitable to approach the Town Council in the matter, seeing that electricity is at present rationed and the possibility of changes in the personnel of the Electricity Committee. It was resolved to delay further consideration of the matter until the January meeting.

It was agreed to hold the annual dinner on the first week of December, and the following members were appointed a committee to carry out the arrangements:—Messrs. Young, Moffat, Macalpine, and Balmain.

This concluded the business of the meeting.

CROYDON CAMERA CLUB.

ON Wednesday in last week, November 5, the "annual" dinner was held, the first since 1913. The president, Mr. John Keane, formed the centre of a large company (numbering between sixty and seventy) of members and guests, the latter including Dr. Atkin Swan, Messrs. F. C. Tilney, James A. Sinclair, T. H. B. Scott, W. L. F. Wastell, and G. E. Brown. Letters of regret at inability to be present were received from Messrs. R. Child Bayley, F. J. Mortimer, W. H Smith, and S. H. Wratten. It was quite a gathering in the spirit of the old pre-war days, and Mr. Keane appropriately echoed the feeling of those present when he claimed that apart from the work which members of the club had carried out by way of contribution to the winning of the war, the Club as a whole had manifested the national spirit of dogged persistence by keeping its meetings going without interruption. It was that spirit, he said, which in a hundred different walks of life had preserved the country throughout the circumstances of the past five years. In felicitous terms he proposed the toast of "The Guests," contributing a complimentary thumbnail sketch, so to speak, of each in turn. Croydon can do a thing like this in the happiest manner, and it appears to be a tradition of its presidents to be able to express the most honeyed opinions of those to whom it offers its generous hospitality. An attempt perhaps to dissipate the idea that in the ordinary way plain speaking between its own members is ever taken to the point of simulated rudeness. Dr. Atkin Swan and Mr. T. H. B. Scott replied to the toasts, each in his accustomed and delightful style of humour. Other toasts interspersed a most enjoyable evening, the pleasure of which owed a good deal to the musical and narrative performances of Mr. Tilney, Mr. H. P. C. Harpur, Mr. Ackroyd, Dr. Swan, and the Rev. Le Warne.

LANCASHIRE SOCIETY OF MASTER PHOTOGRAPHERS.

THE members of the society had a very good time at Southport on October 28, when the whole of the day was devoted to business and pleasure. Mr. F. Read, the popular and enthusiastic treasurer of the society, had control of the arrangements, and, needless to say, under his able guidance they were perfect. Those who, like himself, were devotees of golf met at the railway station early in the day, and spent the whole of the morning until lunch time on the links, whilst those kindred souls who preferred the homeliness of the smoke-room to the excitement of the golf links entertained each other in the delightful lounge of the Queen's Hotel, which, through the kindness of the management, had been placed at the exclusive use of the members of the society.

The business side of the day commenced at 2.30 with a committee meeting, a large number of committeemen from the various parts of Lancashire being present.

In the absence of the President of the society, Mr. F. Kenworthy, the committee unanimously voted Mr. F. Read into the chair, and a very able chairman he made.

A great amount of important business was dealt with in the hour devoted to this meeting, and all the important points raised were fully discussed at the subsequent general meeting.

The general business meeting, to which all the members had been summoned, commenced at 3.30, Mr. F. Read again presiding.

The Secretary having read the minutes of the committee meetings held since the last general meeting, a number of questions arising out of these minutes were discussed, amongst the most important being Assistants' Specimens, as already reported in the "Journal" some time ago, which suggested that the assistants be allowed a set of specimens before leaving the employment of any member, these specimens to be secured from time to time by the assistants and submitted to the employer, and if the employer was satisfied that they were the work of the assistant he (the employer) should sign the specimens accordingly and forward them on to the secretary of the society to be endorsed by the seal of the society. On the assistant leaving the employer a covering letter should be given to each assistant intimating that the specimens submitted were the work of that assistant. The letter should also bear the crest of the society, and it was therefore decided to recommend to the whole of the members the adoption of this system at as early a date as possible.

A very lengthy discussion took place on the important question of the price of bromide paper, and in the course of the discussion it was pointed out that, although the paper restriction Order No. 31918 had been withdrawn on April 30 this year, making it possible for all paper bases to be imported, as in pre-war days, yet no attempt had been made on behalf of the manufacturers to make any satisfactory reduction in the price of bromide paper.

Another important question discussed by the committee was that of apprentices, and it was the general feeling of those present that at the next general meeting of the society the members should come prepared to thoroughly thrash out this question.

Mr. W. H. Hulsh, the secretary, had undertaken to give a paper at the next general meeting on the question of "Industrial Councils," and it was thought that, in conjunction with this paper, the apprentice question could be very fully gone into.

It was arranged to hold the next general meeting at the George Hotel, Preston, on Tuesday, November 18, at 5.30, and the secretary was instructed that, when sending out the notices regarding this meeting, he should invite the members to come prepared to discuss this important question.

A suggested design for the diploma of merit in connection with the recent exhibition held at Blackpool was submitted to the committee, but not approved, and it was decided to offer a prize of £1 1s. to the member who could send in the best design, the same to be in the secretary's hands before the next general meeting.

At 5.30 the members sat down to tea, after which a social gathering was held. In the absence of a number of well-known artists, who had unfortunately been prevented from attending, Miss Marie Philpott and Mr. G. Mills kept the company entertained and amused until 9.30, when most of the members were obliged to leave in order to get their trains home.

Commercial & Legal Intelligence.

Prices of Mounts.—In the Shoreditch County Court on Tuesday, November 11, before Judge Cluer, the hearing was resumed and concluded of the action in which Messrs. O. Sichel and Samuelson, of 52, Bunhill Row, E.C., cardboard merchants and photographic material manufacturers, sued Mr. N. Mrèches, of Kingston Studio, 27a, Market Place, Kingston-on-Thames, to recover £5 16s. 10d. for 1,000 cardboard photographic mounts. At the first hearing of the action the plaintiffs' traveller said he took the order for 500 of each size of two mounts. No price was fixed, as it was expressly stated by him that cardboard manufacturers would not give any fixed prices at this time, August, 1918. The defendant denied giving the order, and also protested that anyway the price was very unreasonable. The hearing was adjourned for the plaintiffs to prove by the manufacturers' prices that their price was reasonable. When the hearing was resumed Mr. McDonald appeared as counsel for the plaintiffs, and he explained that as he was not present on the first occasion he proposed to go over the case again. Judge Cluer positively refused to allow the case to be reopened and thus delay the other work of the Court.—Mr. McDonald: Your honour will remember it was adjourned for proof that the price charged was fair.—Judge Cluer: What am I here for but to remember these things?—Mr. Fordham, of the firm of Messrs. Fordham and Co., said they printed the cardboard photographic folders. There were 500 each of two sizes, 6 ins. x 4 ins. and 8 ins. x 6 ins., and the charge was £4 7s. 3d. in all.—Mr. McDonald: And would a charge of £5 16s. 10d. be an unreasonable one under the circumstances?—Witness: Do you want me to say from the point of view of what a manufacturer usually gets as a profit or as a profit by the plaintiff?—Judge Cluer: I think the point is fine. It appears to have been an addition of a little more than 25 per cent.—not an outrageous profit in these days.—This closed the plaintiffs' case, and the defendant then said he disputed the giving of the order altogether. What happened, he declared, was that Mr. Coomb, the traveller, called upon him and showed him a number of mounts. Defendant was pleased with some of them, and asked for the prices, but the traveller said he had forgotten them. Defendant asked him to let him know, as, if the price was right, he would order 1,000 each of them. The next that happened was a month after, when he received the 500 each of two sizes. As he knew nothing of the price, and had not ordered them, he rang up Mr. Sichel, and asked him what he should do about them. Mr. Sichel told him to keep them till the traveller called, and he did so. When Mr. Coomb arrived he pretended that he thought he had taken an order, and asked him if he would make an offer for them. Defendant said he hardly could as they were asking twice as much as other manufacturers. Mr. Coomb finished by leaving them there.—Judge Cluer: Why didn't you send them back?—Defendant: I did send them back.—Judge Cluer: Not until nine months after. It may be that there are travellers who carry on sharp practices, and declare they have taken orders which they have not, in the hope of being able to induce the person to accept them; but I have no reason to suppose so in this case. He says you gave him the order, and I see no reason to doubt it; you kept the goods for nine months after.—Miss Bailey, an assistant in the shop, was then called, and said she was present when Coomb, the traveller, was showing off the cardboard mounts. She was quite positive that when he was asked the price he said he did not know, and promised to send it on, so that an order might be arranged.—Judge Cluer: Did he say why he did not know the price?—Witness: No.—Judge Cluer: Well, he has told us why—that the manufacturers were not giving fixed prices at the time; a perfectly reasonable reason. I have come to the conclusion that an order was given, and my verdict will be for the plaintiffs.—Judgment was entered accordingly, with costs. On the first hearing the plaintiffs had to pay to the defendant 12s. 6d. costs, and this amount will be set off.

The Affairs of Frank Soward, 32, Coniston Road, Muswell Hill, N., who had been interested in two companies, called Colourgraphs, Ltd., and Photocol, Ltd., have previously been reported in these columns, and on November 4 they came before Mr. Roger Mellor at the London Bankruptcy Court upon the hearing of debtor's application to approve a proposal providing, inter alia, for the payment of a composition of 5s. in the £ to his unsecured creditors. He failed on July 3 last, and, in the opinion of the Official Receiver, the proofs of debt and probable claims aggregate £867, whilst the assets were estimated by the debtor to realise £9. He acted as a director of Photocol, Ltd., until June last, and he attributes his insolvency to his association with another person, estimating his loss in that connection at £950, of which £450 represents the amount of cash that he provided for financing the two companies mentioned.

When the case was called on for hearing the Official Receiver reported that the debtor was not in attendance, neither had the sum necessary to pay the composition been lodged with him.

In the circumstances his Honour refused to approve the proposal.

Legal Notices.—Notice is given of the dissolution of the partnership between John William Heawood and Joseph Watson, lately carrying on business as photographers at Station Road, Hinckley, Leicester, under the style of Heawood and Watson. John William

Heawood retires, and the business is being carried on by Joseph Watson, who will receive and pay all debts.

NEW COMPANIES.

SUNBEAM PHOTO, LIMITED.—This private company was registered on October 31, with a capital of £1,000, in £1 shares, to take over the business of a photographer carried on on the foreshore at Margate under an agreement between F. L. Peltman and Martha E. Whitrose of the one part and the corporation of Margate of the other part. First directors: F. L. Peltman, 2, Cliffside, Fifth Avenue, Margate, contractor; T. Head, 13, Godwin Road, Margate, photographer. Registered office: 12, Dalby Road, Margate.

SCIENTIFIC AND PROJECTIONS, LIMITED.—This private company was registered on November 3. Capital, £10,000, in £1 shares. Objects: To carry on the business of manufacturers of and dealers in cinematograph, photographic, scientific, philosophical, electrical, and optical instruments, etc., and to enter into an agreement with F. W. Larkins and S. R. Bailey. The first directors are: C. Fairweather, 37, Hindes Road, Harrow (chairman); A. S. March, 59, Eagle Road, Wembley; and F. W. Larkins, 21, Shrewsbury Road, New Southgate, N. Registered office: 5, Crawford Passage, Farringdon Road, E.C.

GOSNAY ADVERTISING COMPANY (1919), LIMITED.—This private company was registered on November 5, with a capital of £10,000, in £1 shares. Objects: To take over the business of advertising and photographic contractors, printers, zinco and wood engravers, etc., lately carried on by the Gosnay Advertising Company, Limited, at 6 and 7, Little White Lion Street, Long Acre, W.C., and to enter into an agreement between said old company of the first part, W. J. Mawrey, F. A. Wood, and H. J. Jewell of the second part, Odhams, Limited, of the third part, and W. J. B. Odham of the fourth part. The subscribers (each with one share) are: W. J. B. Odham, 93-4, Long Acre, W.C., director and publisher; J. S. Elias, 93-4, Long Acre, W.C., printer and publisher. The first directors are: J. S. Elias, W. J. B. Odham, and F. Mills. Registered office: 93-4, Long Acre, W.C.2.

News and Notes.

THE STEREOSCOPIC SOCIETY.—After twenty-six years of successful working, this society has now inaugurated a branch in the United States, and includes in its fortnightly portfolios interesting slides submitted by its members across the Atlantic. The consequent interchange of specimens of members' work, as well as methods and ideas connected with stereoscopic photography, should be of the greatest value to the members. The hon. secretary, Mr. W. Tillott Barlow, The Peaks, Bognor, Sussex, will be pleased to furnish all particulars and receive applications for membership on the Home Circuit: on the American side information can be obtained from the branch hon. secretary, Mr. W. S. Cotton, 5,021, 33rd Avenue S.E., Portland, Ore., U.S.A.

MAGAZINE REFLEX CAMERAS.—In reference to our reply to a querist in our issue of October 24 last, a correspondent, Mr. E. S. Maples, Edgerton, Huddersfield, writes:—"You appear to have overlooked the 'Holborn Reflex,' made some years ago by Houghtons, one of which I possessed ten years ago. It carried twelve quarter-plates in sheaths, had automatic changing, RR or Goerz lens, focussing, but not reversing back, Ilex shutter behind lens (not focal-plane), speeded 1—1/100 sec. (if I recollect), and was only the weight of a modern focal-plane reflex, certainly not in any way heavy. The 'Flexet' was made by Talbot and Eamer, Liverpool. It was of small size and fitted with either bag-changing magazine, roll holder, or double slides, mirror, behind-lens blind shutter (not focal-plane), 1/10—1/100 sec., rising front, non-reversing back, lens mounted in focussing jacket. Both these were excellent for amateur use where high-speed is not required, the latter particularly being light, small, well-made, reliable, and low in price (£3 10s. plus cost of lens). These cameras are, I believe, no longer made, but could probably be obtained second-hand."

JUBILEE ISSUE OF "NATURE."—Our scientific contemporary in its issue of November 6 last celebrates the completion of fifty years of publication. Sir Norman Lockyer, its founder and for many years its editor, contributes a few "Valedictory Memories," describing the establishment of the paper in 1869, and is himself the subject of an eloquent appreciation by M. H. Deslandres, Director of the Astrophysical Observatory of Meudon. A photogravure portrait of Sir Norman Lockyer is presented as a supplement, uniform with the portraits of other "scientific worthies" which "Nature" has issued from time to time. The opportunity is taken to publish a series of brief reviews of the progress of various branches of science since the establishment of "Nature," and the issue will be read with very great interest for this series of contributions by eminent scientific men of the day. The branches of chemistry provide the chief subjects for these essays, and have prompted the contributions of Sir Edward Thorpe, Professor Armstrong, Professor H. B. Dixon, Professor J. C. Philip, Sir J. J. Thomson, Sir Ernest Rutherford, Professor Soddy, and Professor J. S. Townsend. Mr. Chapman Jones contributes a brief sketch of progress in photography, and Mr. Emery Walker attempts the same task in the field of photomechanical reproduction. These brief papers are appropriately rounded off by one on the promotion of research by Sir Richard Gregory, for many years acting editor of "Nature" and now its editor-in-chief.

Correspondence.

**** Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

**** We do not undertake responsibility for the opinions expressed by our correspondents.*

THE ETERNAL QUESTION AND THE P.P.A.

To the Editors.

Gentlemen,—In your last issue Mr. A. W. Woodmansee writes: "The proposal to form a union under the auspices of the P.P.A. will appeal to very few assistants." May I say that these words must have been penned under a misapprehension? The P.P.A. has no intention of "fathering" a union of assistants. The policy of the Association is clearly expressed in the resolution passed by its Council on June 13 last, viz.:—"That this Council of the Professional Photographers' Association, believing it would be to the general advantage of professional photography that assistants should have an association of their own, urge them to form one, and are willing to provide the sum of £10 to a responsible committee towards the initial expense."

It is obvious that the recommendation is that photographic assistants should have an association *of their own*.—Yours faithfully,

S. H. FRY, Hon. Secretary.

A SIMPLE VARNISH FOR NEGATIVES AND PRINTS.

To the Editors.

Gentlemen,—It has always been advised that all good negatives should be preserved by varnishing them. A cheap and excellent varnish which can be obtained by your readers living in the tropics almost for nothing is to take a bit of gum dammar, say 20 grs. (obtainable from all the Indian shops at a penny an ounce, and known to them as "Arpus" or "Dammar Punai"), and dissolve it in 2 ozs. of motor spirit. Apply the varnish with cotton. If the varnish is not required, it can be removed with the spirit in a few seconds. For bromide prints it might be well to add a little bit of wax and turpentine to the dammar solution. The spirit and the turpentine will evaporate, leaving an invisible varnish on the prints, which will repel water or moisture.—Yours faithfully,

TAN HOOK ANN.

Treasury, Penang, S.S.,
October 6, 1919.

THE ETERNAL QUESTION.

To the Editors.

Gentlemen,—With reference to Mr. Woodmansee's letter in the issue of the 7th inst., his suggestion that the photographic assistants join the National Union of Shop Assistants is certainly good, but I feel sure it will never come to pass, because there is no unity of fellowship in the photographic profession. Take, for instance, one example: I sometimes see announcements which state "No objection to hours." Is that comradeship? If we were in a union they would not dare say that. If they succeed in securing a situation through their "glorious sacrifice," I sincerely

hope they will secure their "tickets" for the next world at the same time. If our profession were indispensable things would be different, but I doubt if the National Union of Shop Assistants would entertain us in their union.—Yours faithfully, "STILL HOPING."

To the Editors.

Gentlemen,—But for the fact that "Still Hoping" has been only recently demobilised his letter should not have been written. Eighteen months ago the columns of the "Journal" contained much correspondence from assistants, and he should know that it is entirely the fault of assistants if they do not form an association of their own and discuss their grievances together. I think it highly creditable to the P.P.A. that they should have been the first employers' association to recognise the trend of modern industries, and have asked the assistants to form a union which they can treat with. There is no proposal now to form that under the control or influence of the P.P.A., and the fact of the P.P.A. suggesting the formation of this body should make it easy for assistants to meet together without fear of adverse consequences.

The Shop Assistants' Union has for years accepted photographic employees as members, but the conditions of photographic employment are so different from those of the ordinary shop assistant that it would be much better if the photographic ones could form an association of their own. Three-fourths of them are probably "factory hands" in a technical sense and some are at times employees of other trade workers on their own account. Besides that, both on the male and female side, a certain number are continually joining the ranks of those who cater for the public directly. Women's competition exists in other occupations, and though I am certainly not desirous of seeing clever women starting studios in my district, we must all admit that for half the studio work done, given equal technical ability, it would be quite as appropriate for it to be done by women as by men. If the women crowd us out we must try our hands at something else, but I don't think there is much fear of it yet.

The chief difficulty in the way at present is that in the smaller towns there are so few assistants and in the larger they are not acquainted with each other, also the shoe does not pinch all alike. "Still Hoping" says he did not know till he was engaged that there was Sunday duty. That's his own fault.

I would suggest that London should take the lead, and if a few assistants between now and the middle of December would canvass the employees of various studios they might then be able to arrange and advertise a social gathering shortly after Christmas, a portion of the time being occupied with business matters and the remainder devoted to a dance. If this were repeated once a month during the winter it would soon be found whether or not a permanent association could be formed. If it did get formed, then no doubt the £10 cheque offered by the P.P.A. would be forthcoming towards preliminary expenses, but there would have to be a little spade work done first.—Yours truly,

LOOK FORWARD.

PHOTOGRAPHIC GOODS AND THE PROFITEERING ACT.

To the Editors.

Gentlemen,—I was pleased to see in your issue of October 31 that Mr. Robert H. Rice has laid a complaint before a Profiteering Tribunal about the price of bromide postcards, and that the Council of our Association (the P.P.A.) are backing him up.

On September 8 last I wrote to the President of the Board of Trade asking him to "apply the Profiteering Act to photographic glass plates, postcards, paper, and chemicals." At the same time I stated that there was a "combine" or an agreement for the fixing of prices among the "leading manufacturers of photographic plates and papers."

Under date September 13 I received an acknowledgment of my letter. By letter dated October 14 I was informed that the "Complaints Committee" had decided that the "'article' complained of is not at present included in the Schedule to the Profiteering Act, 1919." The letter further stated "that immediate steps are being taken to include this in the Schedule, which will be extended in the immediate future."

It would be a good thing if representatives of the P.P.A. and of the Manufacturers' Association could get together, and, if possible, issue to professional photographers and to manufacturers an agreed statement as to the prices that ought to be charged to the professional for plates, postcards, and paper; for chemicals, also, if possible, but the latter would be more difficult. Manufacturers have had to contend with very serious difficulties. They have survived, have come out on top, and have done very well. The best minds of the times are out for conciliation and for good will. Cannot we have that between the manufacturers and the professionals?

Failing agreement as to what are fair prices, we professionals must fight the manufacturers. So here is an olive branch in one hand, and a sword in the other!

Any action taken by professionals under the Profiteering Act will, I think, be much more effective by all participants (or belligerents!) working together through the P.P.A. Some weeks ago a traveller in our trade said to me: "To hell with the 'combine.'" To that I prayerfully assented.

A. SIMPSON.

3A, New Briggate, Leeds, November 4, 1919.

[In order to render definite the third paragraph in our correspondent's letter, we applied to the Board of Trade, and have been informed that sensitive emulsion-coated plates or papers have not (up to November 8 last) been placed on the schedule of the Profiteering Act, and that therefore it is not competent for a local committee to deal with complaints in respect of the sum charged for these goods. We see, however, in last week's "Board of Trade Journal" that photographic materials are among the goods complaints in regard to which were lodged with the Central Committee appointed under the Act.—Ed. "B.J."]

UNRETURNED PROOFS AND THE PHOTOGRAPHER'S LIABILITY AS TO THE NEGATIVES.

To the Editors.

Gentlemen,—The case relating to unreturned proofs referred to in the "British Journal" of last week raises a point of practical interest to photographers, but the legal principles on which an answer to the question depends are surely so clear that there can be no doubt of the decision which would be arrived at by a Court of Justice.

The question depends on the provisions of the Statute of Limitations, 1623 (21 Jac. I., cap. 16), which enacts that an action on a simple contract (*i.e.*, a contract not made by deed) must be brought within six years. Further, any action on the case generally must be brought within six years from the time that the right of action accrued.

In order to make the matter quite clear, let us suppose a case more in favour of the sitter than the present case. Suppose that the customer had returned the proofs and that the photographer had made default in supplying the prints ordered. In this case, the customer could sue for breach of contract or could rescind the contract and sue for the return of his money. But after six years from the date of the contract all rights of action would be barred under the Statute of Limitations, and the customer could neither sue on the contract nor for the return of his money. The facts of the present case are the same, except that the customer, by failing to return the proofs, put it out of the power of the photographer to perform his contract. It is, therefore, quite clear that any right of action of the customer was barred at the expiration of six years from the date of the contract, and that the present owner of the business is under no liability.

Another question incidentally raised is as to the liability of a photographer for the safe custody of negatives. In the absence of a special contract it seems that a photographer is under no obligation to keep negatives. The usual contract between photographer and customer is that the photographer shall supply a certain number of prints in consideration of receiving a certain sum of money from the customer. As soon as the photographer has supplied the prints his liability under the contract is determined by performance. If the customer afterwards orders further prints he makes an offer of a new contract, which does not become binding on the photographer unless he accepts it. If, therefore, the negatives have been lost or destroyed, the photographer can be under no liability unless he accepts the customer's offer, and, of course, he is under no obligation to do so.

The negative, which is the property of the photographer, is simply an object made by him for the purpose of carrying out his

contract to supply prints, just as a manufacturer might make a mould in order to supply a number of casts ordered from him, or a shoemaker might make a last in order to supply a pair of boots. The customer has no rights whatever in the negative other than the right (arising from his copyright in the photograph) of restraining the photographer from publishing prints made from it.—Yours, etc., SYDNEY C. SPINK, LL.B.

Lochiel, Dyke Road, Hove,
November 7, 1919.

Answers to Correspondents.

SPECIAL NOTICE.

In accordance with our present practice a smaller space will be allotted to replies to correspondents.

We will answer by post if stamped and addressed envelope is enclosed for reply: 5-cent International Coupon, from readers abroad.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

H. B.—We know of no agents in this country for the Condensed Chemical Dictionary; our publishers are not supplying it.

G. H.—You can obtain spare parts and accessories for Goerz cameras from Mr. R. E. Peeling, 4-6, Holborn Circus, London, E.C.

D. D.—As we understand the Licensing Order it certainly applies to itinerant photographers, since it applies to any retail business which is carried on locally.

D. W.—We do not know of any firm publishing working drawings. Messrs. Cassell have a book on making photographic apparatus the drawings in which are, we think, about the nearest thing to what you want.

T. D.—If the registration is being made because the business is not being carried on in the names of the partners, then the office to which you should apply is 39, Russell Square, London, W.C.1. The cost of registration is 5s.

W. M.—If you have been carrying on a local business in photography for four years past you certainly do not come under the Retail Businesses (Licensing) Order, which applies only to businesses established since February, 1918.

F. F.—Every photograph taken by a photographer "on his own" becomes automatically copyright, and it has not to be marked "copyright." We suggest that you should read the article on this very subject in the "B.J." of Oct. 31.

H. B.—If the business is being newly established, and carries on a retail trade locally, you require to obtain a licence under the Retail Businesses (Licensing) Order, the office for which is 15, Athol Crescent, Edinburgh. There is no other formality.

E. M.—We think from your decription that the process is a modification of the true-to-scale method worked out and patented a year or so ago by the firm of B. J. Hall, Great Peter Street, London, S.W. We think if you wrote to them you would find out what you wanted.

E. P.—Presuming that your friend is a British subject, the photographs which he has taken automatically become copyright in this country without his doing anything at all. You should see the article on this very subject which appeared in the "B.J." of October 31.

J. D.—Your best plan will be to have two thin curtain poles or even wires, one at the top of the window and one 4 ft. from the ground. Run the curtains on these with rings, in two rows. Have dark sateen or casement cloth curtains at each end and white nainsook ones in the centre.

N. E.—We have not published instructions for making a print washer and do not know of any book containing them. Most makers of enlargements do not use mechanical washers at all, but simply transfer enlargements from dish to dish of plain water. Worked properly, this is by far the most efficient system of washing.

F. B.—Presuming that the F. and the A.E. are the initials (and the full initials) respectively of your wife and yourself, you do not come under the Business Names Registration Act, but it is necessary that a licence should be obtained for starting a new business, the office for which is 99, Queen's Gate, South Kensington, S.W.7.

A. B.—A common cause is a developer which does not act quickly enough. Most gaslight cards should come up to full depth the moment they are placed in the developer. If they don't the high-lights are very often stained. Your two latter queries would be better answered by the makers of the card, since you do not tell us what brand you are using.

C. E.—We think 1 part of glacial acid to 10 of water will be strong enough to move the distemper. About 2 ozs. of the gelatine powder dissolved in a pint of warm water would be enough to hold the 2 lbs. of whiting. Wet the canvas first, and put on the distemper thinly. An ounce of white sugar will be ample, but it really should not be necessary if you only apply a thin coat.

J. F.—We are afraid there is no remedy for stains on clothes caused by M.Q. developer. The best thing you can try is a little bleaching powder (chloride of lime) made into a thin paste with water and a drop or two of hydrochloric acid added to give the mixture a strong chlorous smell. This may take out the stain, but in nine cases out of ten will take out the colour of the fabric also.

W. A.—1. There is no other system which has any advantage as regards cost of convenience over the condenser lantern. The Parallax is sold in America, but so far as we know has not been very widely used. We should think it is rather costly. 2. An excellent type of printing box was fully described, with drawings, in an article by Mr. W. Marshall in the "B.J." of March 30, 1917. 3. They are probably due either to dirt in the washing water, or in the drying room, or to floating developer dust settling on the plates before development. We can only suggest filtering the tap water, drying negatives in a muslin chamber, and proper cleanliness in making up developer. 4. For fine work, waterproof ink is about the best thing. You can get it from any dealer in process requisites, such as Messrs. John J. Griffin and Sons, Kemble Street, Kingsway, W.C.2.

The British Journal of Photography.

Line Advertisements.

Charges for Insertion.

Since advertisements cannot be inserted until fully and correctly prepaid, senders of line announcements are asked to bear in mind the scale of charges. They will thus save themselves delay in the publication of their announcements. A Schedule by which an advertisement can be correctly priced will be sent on request.

Net Prepaid Line Advertisements.

12 words or less 1/-
Extra words ... ... 1d. per word.
(No reduction for a series.)

Special Note. Box Number Advertisements.

"Box No." and office address ... ... charged as 6 words.
For forwarding replies add ... 6d. per insertion for each adv't.
If replies are called for this latter charge is not made.

Advertisements cannot be inserted until fully and correctly prepaid.

Orders to repeat an advertisement must be accompanied by the advertisement as previously printed.

Advertisements are not accepted over the telephone or by telegram.

The latest time for receiving small line advertisements is 12 o'clock (noon) on Wednesdays for the current week's issue.

Displayed Adv'ts should reach the Publishers on Monday morning.

The insertion of an Advertisement in any definite issue cannot be guaranteed.

HENRY GREENWOOD & CO., Ltd., Publishers, 24, Wellington Street, Strand, LONDON, W.C.2.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3107. Vol. LXVI. FRIDAY, NOVEMBER 21, 1919. Price Twopence.

Contents.

	Page
Ex-Cathedra	673
Copyright in Old Photographs: The Effect of the 1911 Act on Copyrights Created Under the 1862 Act	674
Practicus in the Studio. By Practicus	675
Some Suggestions on Photographs of Tile Work	676
Assistants' Notes	679
Exhibitions	680
Forthcoming Exhibitions	680
Patent News	680
Analecta	682
New Books	682
New Apparatus, etc.	683
Catalogues and Trade Notices	683
Meetings of Societies	684
Commercial and Legal Intelligence	684
News and Notes	685
Correspondence— Photographs of the Nude at the Royal Photographic Society's Exhibition — The Assistant Question—Mounting Blocks to Point Ems	686
Answers to Correspondents	687

SUMMARY.

In a leading article we endeavour to make clear the very confused position in which old photographs stand as regards copyright, owing to the inconsistencies, as regards the definition of "author," between the present (1911) Act and that of 1862, which it supersedes. (P. 674.)

The concluding portion of the notes on the photography of tiled rooms and premises, issued by an American association of tile manufacturers, will be found on page 676. As in the case of the previous series of notes, they emphasise in an excellent way many of the things which require to be kept in mind in the making of satisfactory commercial photographs and lose nothing of their value from the fact that they are written from the standpoint of the user of the photograph

In his article this week "Practicus" deals with the carbon printing process, outlining in a general way the manipulation necessary in working the double transfer form of it. (P. 675.)

In reply to a question in the House of Commons it was stated that aerial methods of surveying for mapping purposes are at present more expensive and less accurate than those employed by the Ordnance Survey. (P. 685.)

Nearly 133,000 photographs of soldiers' graves have been supplied by the War Office organisation responsible for this work. (P. 685.)

The National Union of Shop Assistants sends us a letter pointing out the position it has taken up in reference to the admission of photographic assistants. (P. 686.)

After having held the office for twenty-nine years, Mr. H. C. Hemmingway is retiring from the secretaryship of the Rotherham Photographic Society. (P. 680.)

Details of construction of anastigmat lenses and of a self-portrait shutter-release figure under patent news. (P. 680.)

A pattern of folder which provides good protection for the photographs and at the same time is of distinctive appearance forms the subject of a paragraph on page 673.

Inadequate contact between negative and printing paper is the cause of defective quality in many prints which are made at the present time. (P. 673.)

We repeat an oft-quoted maxim that photographers should ascertain the cost, not of materials only, but of their own labour, rent, rates, etc., applying to any particular job. (P. 674.)

Stained prints, business agreements, licences for new businesses, and duration of copyright are among the subjects briefly dealt with in "Answers to Correspondents." (P. 687.)

EX CATHEDRA.

A Mounting Hint. We recently handled a number of etchings, which were protected by being placed in folders composed of large sheets of thick cartridge drawing-paper. The prints were attached to the third page by the corners, while an opening cut in the front leaf allowed the whole subject, including the artist's signature, to be seen without risk of damage from handling. In one or two examples, where the edges of the plate paper were already frayed, additional security was given by fastening the front leaf to the back one by means of a thin line of glue down the fore edge. Although primarily designed as a protection, the effect as an artistic entourage was distinctly good, and might well be adopted for any large-sized photographs in monochrome to which it was desired to give an appearance of distinction. One advantage of fastening the edges together is that when displaying the prints from a portfolio there is no risk of damaging them if one be pushed down between the others. Very little skill is necessary to cut the openings, this being easily done by means of a mount-cutter's knife, a steel straight-edge and a sheet of glass. A piece of card can be cut into a templet and a line ruled with a hard pencil or, better, a stylus, to serve as a guide for the knife.

* * *

Unsharp Prints. Contact printing from small negatives, especially films, is now carried on under conditions which would have horrified many of the old school of printers, who were used to handling negatives made on patent plate-glass, and using "box-form" printing frames with powerful springs. To them the idea of laying a wrinkled film upon a glass bed, putting a piece of stiff bromide paper in contact with it, and lightly pressing a pad upon it to secure contact between them, would have appeared the acme of slovenly work, yet this is what is being done every day by many firms who undertake amateur work. We were struck by the difference in two sets of prints, one being made by the amateur who had produced the negative, and the other by a local chemist, who probably farmed the work out. The former set were quite sharp, but the latter, while good in other respects, were far inferior in this one particular. This is a foolish policy, as it does not encourage the customer to order additional prints, and puts the question of enlargements out of the field. For ordinary portrait work the frames used are often very defective: the little resiliency the springs originally possessed have often long departed, and the backs have warped. With the stout papers now commonly used there is need for far more pressure than when albumenised paper was the only printing medium.

Costing Systems. In many businesses a careful record is kept of the cost of each job so as to form a basis for quoting for future orders. In the printing trade, in which much machinery and many processes are used, it is quite a difficult matter to do this, and the ingenuity of the whole trade has had to be employed to evolve a reliable system. The photographer may well take a hint to do something in the same direction so that he may avoid taking on jobs which we have described as "paying a shilling for thirteen pence cost." On several occasions we have pointed out that the cost of a finished photograph includes much more than cost of materials, labour, and renewals of apparatus. Time is the commodity which the photographer gives away most freely. On a small outdoor job he will frequently spend as much time in travelling and waiting about as, at bricklayers' or carpenters' wages, would amount to half the sum he receives. Many small photographers work outrageously long hours for a very scanty return. Surely, if they work eighty hours per week, they should be charging out those hours at 1s. 6d. each at least. Then comes rent of business premises, materials, help and profit. Why should a man pay himself less per hour than he would have to pay anyone else to do the same work?

COPYRIGHT IN OLD PHOTOGRAPHS: THE EFFECT OF THE 1911 ACT ON COPYRIGHTS CREATED UNDER THE 1862 ACT.

WHENEVER a piece of legislation is repealed by another, there is bound to be a certain degree of difficulty in deciding what is the position, in the period of the repealing measure, in regard to events which took place under the legislation which has been repealed. The law relating to copyright is an instance of this, and evidently, as some recent questions show, is one which photographers are not always able to settle off-hand to their own satisfaction. Although the 1911 Copyright Act has very greatly simplified and, from the photographer's point of view, improved copyright law, there is still the occasion for doubt as to what is the position of photographs taken before the present Act came into force.

In order to put this matter clearly to others than our correspondents, it should first be pointed out that it is now immaterial, so far as the subsistence of copyright is concerned, or, rather, so far as concerns the photographer's right to take action for infringement, whether the photograph was or was not registered at Stationers' Hall in accordance with the provisions of the previous (1862) Act. Under this former Act copyright was created, just as it is under the present one, by the creation of the work, but it was made a special condition that no action could be taken in respect to infringement which was prior to the registration of the photograph at Stationers' Hall. This disability is removed in the 1911 Act, and, at the same time, the benefit thereby conferred upon photographers extends retrospectively to photographs taken under the 1862 Act.

On the other hand, it requires to be made clear that it does not necessarily follow that a photograph taken under the 1862 Act, whether registered or not, is now the subject of copyright. Copyright may or may not subsist in it. And it is not by any means an easy matter to determine whether it does or not. This difficulty arises from the alteration in the term of copyright which is made by the 1911 Act. In this Act photographs are treated differently from other literary and artistic works, and are granted a fixed term of copyright of fifty years from the time of making the negative. Moreover, the Act is retrospective as regards this question of duration, for Sect. 24 provides that under the new Act copyright in photographs taken under the old Act shall last for the term for which it would have lasted if the 1911 Act had been in force at the date that the photograph was made if—and it is a big if—any copyright at all subsists in the photograph at the time the present Act came into force.

In order to understand the effect of this position it is necessary to bear in mind the provision of the old Act as regards duration of copyright. This, instead of being a fixed term, was for the life of the author and seven years after his death. Thus, it must be remembered that the 1911 Act does not do anything to restore copyright which has ceased to exist through a period of seven years having elapsed between the death of the author and the coming of the 1911 Act into force. As the 1911 Act came into force on July 1, 1912, it follows that in order for copyright to have been in existence (under the 1862 Act) on that date it is necessary that the author of the photograph should have been alive on July 1, 1905. Even then it does not necessarily follow that copyright exists any longer in the photograph, for in the case of photographs taken in the first few years after 1862 the full term of fifty years, provided by the 1911 Act, may have run its course. In most cases, however, the copyright which, under the 1862 Act, was still in existence on July 1, 1912, is prolonged for a few years by the 1911 Act, and therefore at first sight it seems an easy matter for a photographer to decide what his position is in respect to any studio or other negatives in his position.

Unfortunately, it is not so easy as it seems on account of the fact that the meaning attached to the word "author" of a photograph is very different in the two Acts. In the 1911 Act the "author" of a photograph is arbitrarily defined as "the owner of the negative when the negative is made," and may be an individual or a corporate body. But in judgments of the courts under the Act of 1862 it was held that the "author" of a photograph was the person who actually superintended the arrangement by putting the sitter or members of a group into a position, or selected the view and arranged it in the camera. In other words, the "author" very often was not the master photographer to whom the copyright belonged but his studio or landscape operator. Yet, according to this legal judgment, it was the life of this assistant which determined the duration of copyright. It will thus be seen that in probably 50 per cent. of existing studio or landscape negatives made under the 1862 Act it is impossible for a photographer to discover whether the real "author," according to this judicial ruling, was or was not alive on July 1, 1905. How many photographers through whose employment dozens, if not scores, of assistants have passed can say what has subsequently happened to them! Apparently this is one of the things which was entirely overlooked in drafting the 1911 Act. The difference in the definition of the "author" evidently escaped the notice of the draftsmen of the Act. Yet the Act is plainly made retrospective only as regards this one question of duration of copyright. We cannot recollect that the point has ever been raised in any action for infringement of copyright, probably for the reason that in such a case a photographer conveniently forgets the existence of a subsequently undiscoverable assistant, and no one could reasonably blame him for doing so.

THE AVIAR ANASTIGMAT.—By a mistake last week in the review of the British Anchutz camera the word Aeroplan was mentioned as the name of the lens by Messrs. Taylor, Taylor and Hobson with which the camera will be fitted. This should have been "Aviar," the new model of which is in preparation for the market by Messrs. Taylor, Taylor and Hobson.

PRACTICUS IN THE STUDIO.

[Previous articles of this series, in which the aim of the writer is to communicate items of a long experience in studio portraiture, have appeared weekly since the beginning of the present year. It is not thought possible to continue the series to the length of that by the same writer which ran through the "British Journal" some years ago, but if any reader among the younger generation of photographers, and particularly those engaged as assistants, has a particular subject which might be dealt with, his or her suggestion will be welcomed. The subjects of the previous articles of the series have been as follows:—

A Talk About Lighting (Jan. 3).
The Camera and the Lens (Jan. 10).
Managing the Sitter (Jan. 17).
Backgrounds (Jan. 24).
Studio Exposures (Jan. 31).
Artificial Lighting (Feb. 7).
Printing Processes for Portraiture (Feb. 14).
Studio Accessories and Furniture (Feb. 21).
The Surroundings of the Studio (Feb. 28).
Studio Heating and Ventilation (March 7).
The Postcard Studio (March 14).
The Printing-Room (March 21).
About the Reception Room (March 28).
Home Portraiture (April 4).
Portable Studios (April 11).
Copying (April 18).
Handling the Studio Camera (April 25).
More About Lenses (May 2).
Enlargements (May 9).
Advertising the Studio (May 16).
Mounts and Mounting (May 23).
Business Methods (May 30).
Photographing Children (June 6).
Portraits of Elderly People (June 13).
Something about Lenses (June 20).
Hand Cameras for Professionals (June 27).
The Dark-Room and Its Fittings (July 4).
Plates and Their Work (July 11).
Apparatus Repairs and Renovations (July 18).
Posing the Head (July 25).
Intensifying Portrait Negatives (Aug. 1).
Workshop Jobs (August 8).
The Personal Factor (Aug. 15).
The Keeping of Negatives (Aug. 22).
Reduction of Negatives and Prints (Aug. 29.)
Leaky Roofs (Sept. 5).
Blinds and Curtains (Sept. 12).
Miniatures (Sept. 19).
Printing Portrait Negatives (Sept. 26).
Wedding Groups (Oct. 3):
Combination Printing (Oct. 10).
Flashlight Work (Oct. 17).
Flashlight Portraiture (Oct. 24).
The Question of Outfit (Oct. 31 .
Telephoto Lenses for Professional Work (Nov. 7).
Changing Quarters (Nov. 14).

CARBON PRINTING.

I HAVE had occasion to mention the carbon process of printing several times in this series, and it seems fitting that one article at least should be devoted to practical working instructions. The apparatus and materials required, outside that usually found in a photographer's workroom, are simple and inexpensive. Assuming that there is a sufficiency of printing frames with good strong springs, several porcelain dishes in whole-plate size or larger, and some clean dusters, the following articles must be procured:—Carbon tissue in the colours it is intended to use (for a start, sepia and warm black are a good selection), temporary or flexible support, final support—also called double transfer paper—waxing solution, a flat squeegee and rubber cloth, an actinometer, some alum for fixing, and, if the tissue has to be sensitised at home, a little bichromate of potash and an ounce or so of ammonia. All these can be procured for a few shillings; the rise in price since 1914 has only been about 15 per cent. It is usual to start instruction in carbon printing by describing the single transfer process, but as this necessitates the use of reversed negatives I will proceed at once to double-transfer, which is precisely similar in all respects except the final transfer, which is not required in the single-transfer process. There are innumerable dodges and modifications practised by carbon printers, but in this lesson I will assume that there is only one way of working, and that the student will not try experiments until he can produce a decent print.

Carbon "tissue," as the pigmented paper is called, may be purchased either in a sensitive or insensitive state. As the price is the same for either variety, and as most early troubles arise in the process of sensitising and drying the tissue, I advise that it be bought in the sensitive state, in which it will keep good, if stored in a flat calcium tin, for several weeks. If, however, it be decided to sensitise at home, it is a simple matter if carried out in the following way:—A solution is made containing 1 oz. of bichromate of potash in 20 ozs. or 30 ozs. of water. The lesser quantity may be used in summer and the greater in winter, or the strong solution may be used if the negatives are inclined to be vigorous, and the weak one if they are at all upon the flat side. A few drops of ammonia should be added to the solution, to neutralise any acidity, which would cause the tissue to become rapidly insoluble. The tissue should be immersed in the bichromate, one sheet at the time, and the surface carefully swabbed with cotton-wool to break any bubbles on the surface and to ensure even action. If any portions receive a longer coating by allowing streaks to remain, it is quite possible that these will show in the finished print. The tissue should remain in the solution for three minutes in winter and about one and a-half or two minutes in summer. When ready, the tissue should be lifted out of the bath without draining and squeegeed down upon ferrotype plate. As the tissue is practically insensitive while wet, the sensitising may be carried out in daylight and the ferrotype plates carried into a weakly lighted room, where they will dry. This room should be warm and well ventilated, so that drying takes about four hours. Slow drying is liable to produce partial or complete insolubility. Sensitive carbon tissue should be treated with more caution as regards exposure to light than platinum or P.O.P., as once light-action is started it continues, so that a piece of tissue exposed to light for half a minute, which might not show any fog if printed and developed at once, would be quite useless in a week.

Very dense or vigorous negatives are not required for carbon printing, although such negatives yield better prints by this process than by any other; but any fairly bright negative will give good results. Very thin flat "gaslight paper" negatives are useless. Before printing it is necessary to "safe-edge" the negatives. This is done by painting with opaque or black varnish a narrow margin round the edge of the plate on the glass side. The tissue must be the full size of the negative, so that the edges are protected by the safe edge, or there will be danger of the deep shadows of the picture starting to frill up from the edges and ruining the print.

Having filled the frame, we turn our attention to the acti-

nometer. This in its simplest form is a small tin box with a glass lid. Inside the lid is a brownish tint with a small clear hole about ¼ in. in diameter, and below this is a disc of P.O.P. We turn the lid until a fresh surface of P.O.P. is under the hole, and simultaneously expose this and the printing frame to the light. If the negative be rather a thin one and free from stain, we expose until the P.O.P. matches the brown tint round it. This we call one tint—it should be sufficient for thin good negatives; for thicker or stained negatives, two, three, four, or even up to eight tints may be needed—that is to say, the P.O.P. is changed and printed to the tint that number of times. With experience it is quite easy to estimate the number of tints needed, and there is sufficient latitude in the development to compensate for a moderate degree of error.

When printed, the tissue may either be developed at once or may be stored in a calcium box until convenient. If prints are left exposed to the air they will continue printing, and under-printed copies may be saved in this way.

Meanwhile the temporary supports should have been waxed and polished. This is done by pouring two or three drops of waxing solution upon the coated side of the support and spreading evenly over with a small pad of new flannelette, taking care to avoid streakiness. When about a dozen have been coated, the first will be ready for polishing with a soft, clean duster, after which the surface should appear smooth and satin-like. The supports should be waxed at least an hour before they are to be used, and will keep in condition for a month. Opals or ground glass supports are waxed in the same way.

A dish is filled with cold water, say at 60°, and a piece of temporary support laid in it face upwards. Above this is floated a piece of exposed tissue face down. The tissue will at first curl with the gelatine surface inwards, but will gradually flatten out, and if left alone would begin to curl the reverse way. But before this begins—that is to say, as soon as the tissue is flat—it must be adjusted upon the support, withdrawn from the dish, and squeegeed down between the rubber cloth and a smooth board or glass plate. If there are any ridges on the board they will show on the print, as will also uneven or excessive pressure when squeegeeing.

The tissue is now known as "mounted," and must be placed in a blotting book under light pressure for a few minutes, when it will be ready for development. This is effected by immersion in hot water. About 90° Fahr. is a good average temperature. In a minute or two—perhaps longer in the case of tissue which has been kept some days after sensitising—the pigment will begin to ooze out between the two papers. A corner may now be lifted, and if the backing paper comes away freely it is stripped off and thrown away. We have now a smudge of gelatine left on the temporary support, which we place upon a glass or zinc plate and move up and down in the water. If the exposure has been on the short side, the image will develop fully in this way, but most prints require to have the warm water splashed upon them with the right hand while the print on its supporting glass is held in the left. As soon as the highest lights are sufficiently clear, the print is rinsed in cold water and hung up to dry. Hotter water may be used for over-exposure, and in extreme cases a little washing soda may be added. In both cases, however, there is danger of a reticulation of the gelatine in the shadows, and this usually spoils the print.

When quite dry, the print is ready for the final transfer. We do this by soaking a piece of double transfer paper in tepid water until the gelatine surface feels slippery between the thumb and finger. The print is then slipped into the water for a few moments and the gelatine side of the transfer paper brought into contact with the image and squeegeed in the same way as when mounting the exposed tissue, taking care as then to squeegee lightly. The whole is then hung up by one corner till dry, when the print should separate of its own accord from the support, which can be re-waxed and used again and again, so long as the surface is not damaged. The print should be immersed in a 5 per cent. solution of common alum for five minutes, well rinsed, and hung up to dry. This is a bare outline of the operations; next week I will give details which I have omitted to avoid confusion.

PRACTICUS.

SOME SUGGESTIONS ON PHOTOGRAPHS OF TILE WORK.

[We are glad of the opportunity of reprinting through our contemporary, "American Photography," the following notes which form a booklet issued by the Associated Tile Manufacturers of the United States specially in reference to the conditions which require to be observed in making commercially valuable photographs of rooms and places for the floors and walls of which tiles are used. It would seem that the notes have been drawn up for the information of individual tile manufacturers. At any rate, they exhibit such an informed sense of what is required in photographs, not only of these subjects, but of commercial subjects in general, that they deserve the widest publicity which can be given to them among photographers.—EDS., "B. J."]

II.

THE eye is accustomed to perceive three dimensions and their regular diminution as they recede more and more from the eye. This peculiarity of vision must be apparent and seem natural in our photographs. All photographs are rendered in perspective, but, as we shall see, some emphasise or distort perspective. The severe geometrical character of tile work requires especially good perspective.

The perspective of a photograph depends on the focal length and view-angle of the lens, the station point and the level set-up of the camera. Focal length, view-angle, and station point are reciprocal and will be treated together.

Every subject has what might be called its natural viewing distance and viewing height, and a photograph showing the subject as it appears to the naked eye from that point is more pleasing and natural than another of the same subject viewed from a lesser or greater distance or elevation.

To make this clearer, let us assume that a fireplace were to be photographed (fig. 1). In order to take in the entire view of a 5-ft. fireplace comfortably with the naked eye, we would station ourselves about 10 ft. or 12 ft. away (*A*) and look at it from a height of 5 ft. or 6 ft. We do this unconsciously, for the horizontal angle formed by the visional rays between the eye and the extreme left and right ends of the fireplace will then correspond to the natural visional angle of the human eye, somewhere around 25 degrees. This, then, gives us a clue where and how high to set up the camera, provided we have a lens with a similar view-angle (a long-focus lens).

But we may also assume the same fireplace viewed from an easy-chair in front of it into which we have settled down determined to dig through these pages. In this position (*B*) we would not be able to take in the entire face of the mantel without moving the eyes. Moreover, instead of looking down on it from an elevation of 5 ft. or 6 ft., we should see it from a height of, say, 3 ft. Now, we might call this a natural viewing distance also, and feel justified in doing so. But we shall directly see wherein we are mistaken. If we set up our camera equipped with the 25-degree lens at this

point we find that only one-third of the fireplace appears on the focussing screen. Should we be forced to photograph the entire fireplace from this point, we would have to employ a lens with a view-angle of at least 60 degrees. But the minute we do this we lose the very quality of naturalness in the perspective that has been emphasised as highly desirable.

When a small subject is photographed, as a mantel, this shortcoming does not affect our picture seriously. But supposing we

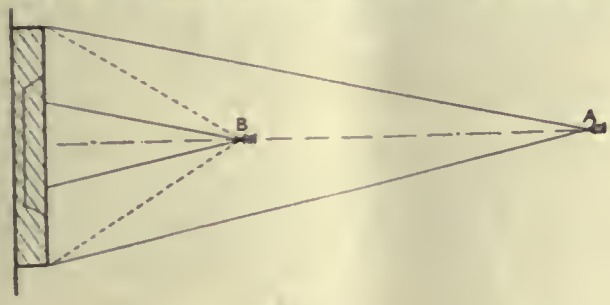


Fig. 1.

wish to photograph part of an average room 16 ft. x 24 ft. in size. Figures 2 and 3 plainly show what portion of the room we could expect to reproduce with lenses of different view-angle from a fixed station point. *AA* is the portion included by the natural view-angle of 25 degrees; *BB* that of the ordinary anastigmat. With *CC* we enter into the wide-angle lenses, and *DD* indicates

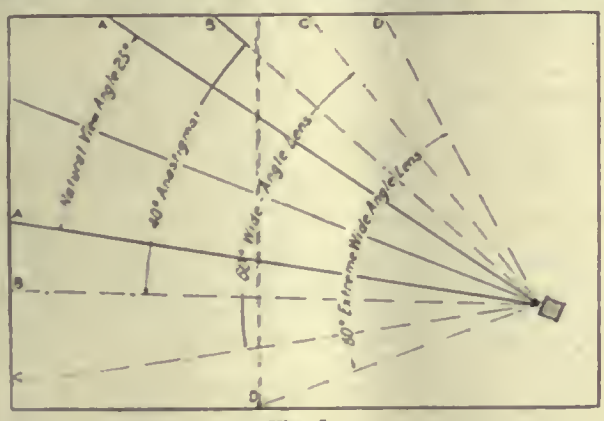


Fig. 2.

the extensive covering power of the extreme wide-angle. Were this same room only 14 ft. long instead of 24 ft., as shown by the dashed line, we can see that no other than a wide-angle lens could be used to photograph an entire wall.

This brings us to the conclusion that in large-sized rooms we can expect to get very near to natural perspective, and should

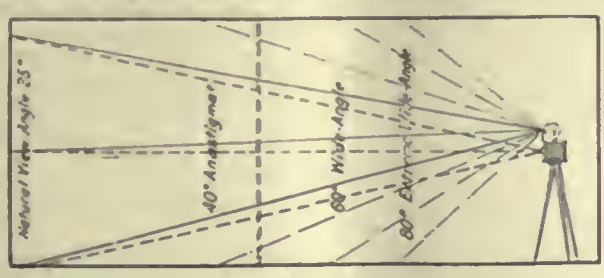


Fig. 3.

demand it in our photographs. But we also know that this quality must be sacrificed in photographing small rooms. And so we have drifted from perspective into a consideration of lenses.

Not by any manner of means is it possible to say just what lens to use for the class of work in which we are interested, no matter how much we should like to do so. But it can't be done! Remember, the lens must be chosen with regard to the station point.

The best all-round lens is an anastigmat of the symmetrical type having a focal length of not less than the dimension of the long side of the plate, which in our case would be 10 ins. As soon as the focal length falls below this dimension, the perspective will become violent. Anastigmats have many advantages: they have great depth, cover a good-sized field, reproduce all objects in the same plane without distortion, give uniform sharpness, and can be used under a great variety of circumstances.

Wide-angle lenses find extensive use in architectural work and render valuable service in crowded quarters. But photographers are apt to use them for all interior work indiscriminately, irrespective of the available space; and this should be prevented. For, as we have seen, these lenses accentuate the perspective, make a room appear much bigger than it actually is, and picture objects near the camera not only too large, but also disagreeably foreshortened. And in all this work we must be determined to obtain as much naturalness and truth as possible. Any subject should be approached with this clearly in mind. We would rather have a smaller portion of the work shown in natural perspective any day in preference to a larger section obtained at the expense of naturalness.

Some photographers avoid the use of wide-angles by placing plate-glass or polished metal mirrors—as clear and correct as possible—in place of the camera, and then photograph the picture mirrored in it. Unfortunately, this is practical only where the subjects are of moderate size.

For completeness' sake mention should be made of telephoto lenses. They offer advantages in very large buildings, in churches, etc., when it is impossible to set up the camera close to the object on account of intervening fixtures or pews.

Now, the tile man will have little to do with the selection of the proper lens, and probably cares less. But we have treated this problem in detail, so that he will know, in selecting his *subjects*, what may be expected and what not. He will then try to avoid jobs that place unnecessary limitations upon the photographer, and this is the real reason why he should familiarise himself with the peculiarities of lenses.

By arrangement, we have here reference to "artistic arrangement by an artistic mind." To begin with, only that portion of the tile work should be selected which gives promise of producing the best picture. Only in rare cases does the view of an entire job make a pleasing picture. Consequently the artistic and appealing side should never be sacrificed for the sake of showing a vast amount of tile.

More or less latitude is left to the photographer in the choice of a station point and the selection of the most suitable part of the tile work under the best possible lighting conditions. If he takes pride in his work he will place his camera in different positions, move it back and forth, up and down, till the image on the focussing screen appeals to his sense of proportion, presents a satisfactory arrangement, shows a relation of parts and forms a tasteful, complete whole. Consciously or unconsciously he applies certain "principles of composition." He moves a chair here, a table there, a vase over there, and so on, and this occasional rearrangement, addition or removal of a chair, a table, a vase, a rug, a flower-stand, a picture, a curtain, and what not, has much to do with the production of a harmonious, enjoyable photograph.

But wait! The heart of the matter lies not in producing an "original" or unusual arrangement. Far from it. Artificial arrangement may rob a picture of much of its convincing powers. And what is balm in one case may be poison in another.

Well, how then shall we arrange? Let Ruskin answer this question: "It is impossible to give you rules that will enable you to compose. If it were possible to compose pictures by rule, Titian and Veronese would be ordinary men." But Ruskin never leaves you thus in the air, for at another point he says: "The principles of composition are mere principles of common sense."

Now, common sense tells us to apply the following principles:—Every picture must have a principal object, the object for which it is taken, and this object must be emphasised in a natural manner. (That's so obvious!) All objects of secondary importance should be arranged or appear in such a way that the eye is led to the principal object. And the principal object should be just a trifle more insistent in crowding itself into the attention of the onlooker than the remainder of incidental objects. This is the principle of Principality.

The next is the principle of Completeness—more common sense. A picture should form a complete whole. The subject of the photograph should be complete in itself. (This does not imply that the whole job must be shown.) Just as the chapters of a book can be complete in themselves, so may a certain portion of tile work be complete in itself. There should be nothing in the picture that leads the eye beyond the edge of the photograph, or sets the mind to wondering what may be beyond, for this would exclude concentration. So, the picture should be self-contained.

The principle of Repetition can generally be applied in pictures of tile work only where rows of windows, columns, chairs, etc., are included and may help in leading the eye to the principal object, or where they themselves are this chief point of interest. Such objects should be photographed in a way that excludes any possibility of monotony. A row of windows exactly opposite the observer and parallel to the picture plane without the helping influence of perspective looks monotonous. This would be reiteration, not repetition as the artist understands the term.

There is also the principle of Radiation, or the convergence of lines of an interior toward the centre of interest, applied in accentuating importance. But all of them are common sense laws, and further enumeration would only entangle and hinder us in freely exercising our individual taste, sense of proportion, and harmony, and similar principles. All are extremely flexible, and some unconsciously applied. Moreover, the constructive principles of each picture are inherent in the picture itself, and the laws and regulations that govern the arrangement of one picture cannot be utilised in the arrangement of another.

The following general hints have been derived from experience. The two halves or sides of a picture should not be congruent. The principal object should appear slightly toward the left or right and below or above the centre of the picture. Dome-shaped ceilings should not be shown without support. The shaft of a column or pillar should not come within the picture unless the capital or base can also be seen. When near the camera, pilasters at the edges of pictures do not close up a picture well.

The principal object of the picture should be in the sharpest focus, at all events, since this will act to emphasise it. But photographers go so far as to subordinate unimportant parts by intentionally holding them out of focus, and here we must object and draw the line between commercial photography—for business' sake—and artistic photographs for art's sake. We are not taking pictures to satisfy our artistic inclinations. While the unimportant portions should be subservient to the principal object, we cannot permit mere suggestive treatment in photographs of tile work. We would very much rather have our prints stamped "inartistic" than show them devoid of definition in "unimportant" sections of tile work to prospective users of tile. For if tile is merely suggested it might appear as if we had to hide some defects; and, besides, to us, tile work is important in every part. Since it is, moreover, impractical to treat the tile work separately and different from adjacent materials, we must leave the matter as stated.

Good anastigmatic lenses can be stopped down to a point of complete focus in every part, and this should be required in all photographs of interiors. Exceptions from this requirement are permissible only in garden scenes, fountains, and other exterior work where the distance may be left in "soft" focus and more the way the eye perceives it.

Without reproduction of joints, tile work cannot be identified as such. Joints constitute what might be termed a necessary nuisance, the reproduction of which is of the utmost importance. A tile wall should plainly show the joints, else it may be mistaken for plaster, marble, or any other smooth material. A photograph of tile work showing deficiency in this respect is therefore worse than useless, and a waste of money.

Faience work presents little difficulty, since the joints are usually wide and consequently not subject to solarisation, to which the disappearance of joints can be laid in general. In walls of white and very dark tile, also in hexagonal vitreous floors of very light and very deep colour, joints have a treacherous habit of disappearing. This phenomenon needs no explanation here, since with exclusive use of non-halo plates for all tile work no serious difficulty need be feared. No photograph should, however, be accepted unless it plainly shows joints at least in the foreground and middle distance.

The comparative merit of a technical or commercial photograph lies not only with showing line and form in pleasing manner, but to an equal degree with a truthful rendering of colour values. This has nothing to do with photography in natural colours; we still have in mind the ordinary photograph rendered in monochrome. No one wants a blue tile to look white or a yellow one black. But this is exactly what will happen unless we instruct our photographer to take special measures. Truthful colour values can be secured only with special plates and a colour filter fitted to the lens.

The panchromatic plate with correctly fitted filter comes nearest to rendering colour values as the human eye sees them. Orthochromatic plates lack in not rendering the reds. But by far the greater number of tile subjects in colours can be photographed with sufficient accuracy with orthochromatic plates and a ten-times screen. Only where reds and yellows predominate, or are of importance, are the panchromatic plate and its regulation colour screen necessary.

An orthochromatic plate without filter, or an ordinary plate with filter, do not produce the desired effect; the use of the filter would merely lengthen the time of exposure.

In everyday photography finish and texture of a print are matters of individual taste. Some prefer highly polished prints, others think they cannot enjoy a photograph unless it has an absolutely dead surface. With us, this is a matter that has nothing to do with preference. Our choice is bound and tied by practical necessity. We *must* have a glossy surface to show up all possible detail and permit its reproduction by photo-mechanical printing processes. Even in colour or tone we have a limited choice: a pure black print or a very deep purplish Vandyke brown. Matt surfaced prints on rough textured paper—no matter how artistic that may be—are absolutely unsuitable for reproduction.

We know that this is at variance with the current conception of artistic photography, but we are bound by conditions and cannot show weakness to the pleadings of any photographer. The print must have clear whites and rich shadows, it must have brilliancy, snap. It must be free from the familiar signs of amateur fingers, pinholes, air bubbles, white or black spots, streaks, chemical fogs, cracks and scratches.

Great care must be taken that the corners of the crisp prints are not bent or broken, and *never* should photographs be rolled or mailed in tubes. Mail them flat, protected on each side with corrugated cardboard.

The best sized photograph for all purposes is 8 ins. by 10 ins. It fits any letter file, it can be mailed in standard sized envelopes, and has pleasing proportions.

Prints should be kept unmounted, since they take less space in files and are easier to handle all around. If liable to be used a great deal, they may be mounted on linen or, better yet, in the following manner: The print is made on single weight paper. A piece of Eastman backing paper is "squeegeed" on a ferrotype plate, and the print mounted on this as on cardboard. When mounted in this way the prints have sufficient stiffness to stand up without special supports, yet take up little room in files, and the glossy back remains cleaner than linen or cardboard.

If a picture shows all perpendiculars slanting towards the same side, it is a sure sign that the camera was not set up level, but tilted toward the left or right.

If these lines are converging—but are straight—the camera was tilted either up or down, something that should never be done in architectural work. The focussing screen should always be perfectly perpendicular or parallel to the picture plane.

When any set of straight lines of the job appear in the picture as curves, so that the entire view seems to be projected on a barrel—a fault that is usually accompanied by blurred edges—an unsuitable and very ordinary lens was used for the work. The technical term for this fault is "distortion," and it is characteristic of cheap lenses.

Now and then one will run across a picture that is sharp in the centre, but shows blurred edges, and the corners seem entirely out

of focus. This may be due to various causes, though usually the plate size was too large for the covering capacity of the lens.

Another frequent occurrence is the distortion of the minute squares, hexagons, or rounds of ceramic mosaic into short dashes—the more elongated, the nearer they are to the edges of the print and usually crossing each other, giving a peculiar, unnatural texture to the floor. So it happens that sometimes a tile floor apparently consists of square ceramic, straight joints in front, and herringbone in the background. This phenomenon is known as and results from astigmatism, traceable to the lens. Modern lenses are corrected for this defect and marketed under the name of "anastigmats."

If the entire picture is indistinct or not sharp, either the camera vibrated during exposure or there was some carelessness on the part of the photographer in focussing. Sometimes the foreground is sharp and the background blurred, or *vice versa;* in such instances the diaphragm was not stopped down sufficiently.

The tile dealer cannot, of course, be expected to look after all these details while the exposures are made—they are all part of the photographer's work. They are enumerated here, however, for the purpose of judging the final result and enabling the dealer to point out any shortcoming.

Assistants' Notes.

Notes by assistants suitable for this column will be considered and paid for on the first of the month following publication.

The Time-Saving Tank.

Now that the busy season is at hand it is well to examine any labour-saving devices with a view to adapting them. To my mind one of the best ways of saving time is by using tanks in place of dishes for development, not necessarily using the Time system, but using tanks for their greater holding capacity.

Let us take a case. The owner of a one-man business is busy operating all day; at perhaps about 9 p.m. he finds himself faced with the task of developing, let us say, 160 half-plates. If he used dishes he would hardly be able to develop more than eight at one time; in which case, allowing 10 minutes' development for each plate, he would take 3½ hours to finish the job. But now suppose he is using tanks—two of them, each taking twenty-five negatives: he can give the same personal attention to each negative, putting those for special treatment into a dish when found necessary, and yet, allowing the same time for development, he will only take half an hour over the job, a saving that is surely worth while.

I may be told that dish development is already obsolete, but I do not think this is so. Especially in middle-class studios it is a common thing for an assistant to have such a job as I have given above, and nothing to do it with except a couple of whole-plate dishes. Surely it is time that this sort of thing was past, for in no industry but ours would such a waste of time and labour be permitted for a moment. An improvement in results may also be expected. It is too much to expect of frail human nature that an assistant will give much "personal attention" to dish developing at midnight, but he will gladly do his best when he knows his hours are not being lengthened by the use of out-of-date apparatus.—A. G. Willis.

The Business Receptionist.

The receptionist in any studio is usually a busy person; there are always multitudes of small things to be attended to—things it does not do to forget, but which run away with valuable time to an alarming extent. Moreover, no matter how harassed or pressed for time she is, no client can be hurried, nor must any trace of haste appear in her manner—that would be bad business. Yet the receptionist is always expected to do her utmost to increase the turnover of the business by what are sometimes rather loosely termed "sidelines," such, for instance, as the sale of enlargements, miniatures, and coloured work generally; and, indeed, it is to her advantage to do so, as in most studios the receptionist receives a commission, additional to her salary, on such sales.

Photography, as we all know, is supposed to be an artistic business, and perhaps it is for this reason that in so many studios ordinary business methods, as used in offices, etc., are markedly absent. Yet the skilful use of some of them—or, at any rate, the adapting of them to studio conditions—might do a good deal towards lightening the receptionist's burdens, and giving her more time to devote to the increasing of the photographer's receipts.

Some of these things, by being systematic and methodical, she can do for herself; in others the owner of the studio must help her out, with the necessary apparatus, etc.

In many studios the receptionist does some at least of the coloured work in such spare time as she may have, or else suggests which specimens, if coloured, might be likely sellers.

Now, I suggest that both time and alterations might be saved in this matter by the use of a colouring book, kept by the receptionist for her own and the colourist's use. Whenever a sitter came, of whom in the receptionist's judgment a coloured miniature, etc., might be made, she should note in a few swift glances the general colour of eyes, hair, complexion, clothing, etc., and, directly the client is gone, note these down, with any special details, such as textures of materials, ornaments, etc., in an alphabet book kept by the receptionist for that purpose. This is invaluable, for it is no more difficult in colouring a photograph to make the colouring accurate than to do it by judgment or guesswork, and where the coloured specimen or miniature is bought it will save many alterations, which are bothersome, difficult, and often not quite satisfactory. Many colours of dress materials, etc., photograph of pretty much the same tone, and if the colourist puts in a dress of purple velvet, when it was a green or brown, it involves a considerable waste of time and temper to alter it. Sometimes, too, such a book of colourings will furnish a most useful guide several years later, if, for instance, miniatures or coloured enlargements are desired of some sitter since deceased, where otherwise the colourist must go by guesswork. In noting colourings she will almost unconsciously form a standard of judgment which will assist her much and enable her to be surprisingly accurate in her colouring.

Now, when enlargements and miniatures are submitted to customers in the hope of their purchasing them, a letter must, of course, go with them, which usually the receptionist writes on behalf of the owner of the studio. The busier the season of the year, the more letters of this kind there always are to write, as, for instance, at Christmas. It means orders and money, of course, but it also adds to the work and strain of the receptionist at a time when she can ill spare the time.

Most studios are now equipped with a typewriter, and the fortunate receptionist can jot down notes in shorthand, too, saving much labour. But usually photographers stop at the typewriter, why I don't know. In conjunction with it some form of duplicating apparatus ought to be used. Then, in some slack hour, the receptionist could, at her leisure, draft out a good and telling letter, forcefully put, to go with these approval specimens. This would then be typed and a carefully cut stencil made on the typewriter. Then one of the most careful of the junior assistants could be set to run off fifty or a hundred or more copies of this letter on the duplicating machine, and thus the receptionist would be set up with well-written letters, ready to send, needing only the addition of date, name and address.

Some photographers always circularise their customers at certain times of the year, as before Christmas, Easter, etc., to remind them of the timeliness of photographs as gifts, etc., the pleasure given by family groups at the season when families are most often reunited, and so on. Printed matter is often used, but frequently a better effect might be produced by typewritten matter, duplicated, and with each name and address inserted. It takes a little longer, but it has the more personal note, and that tells in so personal a business as photography. Moreover, if it is planned by the receptionist, it should bear no evidence of this, but seem to come quite straight from the photographer himself. Then, again, once a photograph is submitted on approval some method is needed of keeping check of the time it has been out, and, if necessary, the posting of a second form letter to remind the customer of the specimen. In no case should more than ten days or a fortnight pass before the sending of a second letter, which also can be a duplicate form letter, skilfully written. All this saves the receptionist much worry and writing, and if a commercial "tickler" system is used, and when entering date of sending out on the card the date for the second letter is also noted on its own

card, in advance, at the appointed time this automatic reminder pops up and does its work, and few or no items will ever be overlooked, while much needless strain on the memory is saved and better results attained.

I might here mention another thing. It is often profitable to make a note of casual remarks by customers. If, for instance, a lady remarks how she admires those sepia enlargements, why, note it down, and, when having one made, look it up and submit her one in sepia. It is much more likely to sell. Another will say that he or she does not like enlargements—clearly a case for a miniature; while yet again another will say that he does not like coloured photographs—a clear case for a monochrome enlargement.

It is just such little remarks as these and such notes of them that will prevent unsold specimens lying on hand, when the photographer would much rather have the cheque for them to pay into the bank. In these matters the operator can often greatly help the receptionist by passing on to her any such comments to be noted down, or, better still, doing it for her before it can be forgotten. Usually the receptionist sees all sitters; if not, the operator could easily note for her the details of colouring, etc.

The net result will be an increase to the coffers of the photographer and more commission for the receptionist, with less worry and bother, and, incidentally, well-satisfied customers.—G. E. H. G.

Exhibitions.

ROTHERHAM PHOTOGRAPHIC SOCIETY.

The thirtieth annual exhibition of the Rotherham Photographic Society was held on the four days, November 12-15, in the Temperance Hall, and drew generous patronage. The war period compelled the promoters to curtail their ambitions by cutting out the open section, and another factor which operated was inability to secure the Drill Hall, a very suitable building, owing to military occupancy. The smaller accommodation this year was the best available, but there was got together in it a really attractive display of pictorial work. A modest attempt to get back to old conditions by inviting outside aid led to a capital entry, and it was encouraging to note the success of members in such good company. The members classed were also encouraging. There was an official opening presided over by Mr. C. H. Moss, J.P., the president, who incidentally mentioned the retirement from the hon. secretaryship of Mr. H. C. Hemmingway (who had held the position for twenty-nine years), and added a few appreciative words. Afternoon tea was served by the ladies' committee. Each evening lantern lectures of a popular type were given, preceded by a short concert. The attendance was exceedingly gratifying, and impressed the council with the urgency of securing a larger room for the next venture. Mr. Bertram Cox, F.R.P.S., Lincoln, judged the principal sections, and Mr. F. A. Tinker, Sheffield, made the awards for members' boards. The awards were as follows:—

Open Section.

Class A.—Prints (any subject).—Bronze medals: Lionel Wood, Woodbridge, Suffolk, "The Wrestler"; L. J. Steele, Portsmouth, "After the Bathe"; M. O. Dell, Walham Green, S.W., "Arrens"; Ralph Chislett, Rotherham, "Stone Curlew" (series); and Herbert Felton, Hanwell, W., "Reflections." Certificates: L. J. Steele, Portsmouth, "The Cairn"; T. C. Evans, Clapham, S.W., "A London Lane"; H. C. Hemmingway, Rotherham, "A Famous Stairway"; W. C. Briggs, Rotherham, "Dolly's Ordeal"; Harold Firth, Doncaster, "Reverie"; E. Tinker, Sheffield, "Autumn Woodlands"; and W. H. Reece, Walthamstow, E., "A Winter Evening."

Class B.—Lantern Slides (Monochrome).—Bronze medals: R. Chislett, Rotherham; Herbert Felton, Hanwell, W.; Harry Smith, Birmingham; and Rev. J. V. Haswell, Scissett, Huddersfield. Certificates: Herbert Felton, Hanwell, W.; W. G. Hill, Stockton-on-Tees; Ernest Tinker, Sheffield; T. M. Fowler, Barnsley; and A. S. Pye, Rotherham.

Class C.—Lantern Slides (Colour).—Bronze medals: S. J. Ford, Birmingham, and W. Firth, Rotherham. Certificates: T. Smedley, Sheffield, and Wm. Firth, Rotherham.

Members' Section.

Class D.—Prints (any subject).—Bronze medals: Cecil Robinson, "Portrait"; Hubert Vardey, "Kingfisher"; and E. L. Hardwick, "Kingswood, Roche Abbey." Certificates: Walter C. Briggs, "Larva of Water Beetle"; Thomas Salvin, "Breezy Waves" and "Where the Sluggish Brook."

Class E.—Members' Boards.—Bronze medals: A. D. Robinson and A. S. Pye. Certificates: Miss E. Eskholme, T. Salvin, C. R. Adams, and A. E. Rawson.

Special Medal for Beginners.—R. Beales; certificate, C. R. Adams.

FORTHCOMING EXHIBITIONS.

October 13 to November 29.—Royal Photographic Society.—Secretary, J. McIntosh, 35, Russell Square, W.C.1.

November 20 to 22.—Nottingham and Notts. Photographic Society. Hon. Sec., A. Beeston, 103, Nottingham Road, Nottingham.

December 20, 1919, to January 24, 1920.—Scottish Photographic Federation. Entries close December 1. Sec.: John Macdonald, 27, Aberfeldy Street, Dennistoun, Glasgow.

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Applications, October 27 to November 8.

Cinematography.—No. 26,892. Cinematograph shutters. J. Crooks.

Aerial Photography.—No. 26,836. Apparatus for photo-restitution of aerial photographs. H. Roussilhe.

Stereoscopic Camera.—No. 27,094. Camera for obtaining stereoscopic photographs. R. C. Barron and I. Castle.

Copying Apparatus.—No. 27,185. Photographic copying apparatus. A. Buchi.

Colour Photography.—No. 27,574. Multi-colour screen for natural-colour cinematography and photography and manufacture thereof. J. Camiller and A. Hay.

Photographic Apparatus.—No. 27,543. Photographic accessory and apparatus combined. C. Cox and W. C. Yalland.

Daylight Development.—No. 27,612. Daylight roll-film developing box. H. E. J. Culverwell.

Photographic Surveying.—No. 27,233. Apparatus for photographic surveying. S. M. Dixon.

Aerial Photography.—Nos. 27,413, 27,444, 27,447, 27,448. Method of production of photographic pictures from aircraft. Naamlooze Vennootschap Techn. Maatschappij Aerofoto.

Aerial Photography.—No. 27,403. Aiming practice apparatus for determining machine-gun fire by photographic exposures. Naamlooze Vennootschap Techn. Maatschappij Aerofoto.

Colour Cinematography.—No. 27,108. Apparatus for cinematograph projection in natural colours. A. Plahn.

Strip-Printing Machines.—No. 27,559. Photographic strip-printing machines. A. P. Taylor.

COMPLETE SPECIFICATIONS ACCEPTED.

These specifications are obtainable, price 6d. each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

Anastigmat Lenses.—No. 133,459 (October 12, 1918). The invention relates to lenses used for photographic purposes, and particularly to those of the type composed of elements separated by air spaces.

An objective of the improved construction consists of two positive and two negative lenses arranged in pairs on either side of the diaphragm. Each pair is composed of a positive lens of relatively

high refraction, and a negative lens having a refractive index equal to, or lower than, that of the positive.

In one pair, the negative lens has a refractive index not greater than that of its adjacent positive, and in the other pair the negative is of lower refraction than the positive lens.

The power of one pair of elements is practically neutral, but may be very slightly positive or negative; and consequently the focal length of the other pair approximates to that of the complete objective.

Generally all the lenses used would be simple, but in particular cases one or more could be composed of two glasses cemented together.

In one form of objective the front pair of elements consists of a plano-convex mounted near to a biconcave lens, and the pair forming the rear portion is composed of a biconvex positive lens mounted very near to a plano-concave negative lens. Both positive lenses are of high refraction. The anterior negative lens is of medium refraction, and the posterior negative lens is of low refraction.

Data for the construction of such an objective are here given. The focal length equals 250 mm. and the working aperture is about one-eighth of the focal length. The description of glass is indicated in the manner adopted by manufacturers of optical glass.

The signs "+" and "−" indicate direction of curvature: "+" being used in the case of a surface having its centre of curvature situated towards front of complete objective; and "—" in the case of a surface whose centre of curvature is situated towards the rear of objective.

Lens.	Glass.	Thickness.	Radii.
Front positive.	N/D 1.611.	12m/m.	− 76m/m
	V = 58 6		Plano.
Front negative.	N/D 1.582	7.5m/m.	+ 250m/m
	V = 41.7		— 74m/m.
Rear negative.	N/D = 1.518	3m/m.	Plano.
	V = 54.		— 172m/m.
Rear positive.	N/D = 1.611	11m/m.	− 172m/m.
	V = 58.6		+ 126.5m/m.

Air space between 1st and 2nd lenses = 7.0m/m.
Air space between 3rd and 4th lenses = 3 5m/m.
Air space between 2nd and 3rd lenses = 10.5m/m.

The claim made in respect to the invention is: An objective, composed of two negative and two positive lenses separated by air spaces, and arranged in pairs in front of and in rear of the diaphragm; the negative lens of one pair being of a refractive index not greater than the adjacent positive lens, and the negative lens of the other pair being of substantially lower refractive index than that of the adjacent positive lens, and also lower than that of the other negative; such objective having one of the mentioned constituent pairs with negative, or not appreciable positive, power, and at least one of its air spaces bounded on one side by a plane surface.—Albert Arthur Smith, 1, Ashgrove Road, Bromley, Kent.

SELF-PORTRAIT SHUTTER-RELEASES.—No. 133,238 (May 22, 1919) The invention relates to shutter-release mechanism for photographic cameras of the kind in which a clockwork mechanism in a small casing attached to a camera automatically actuates the usual shutter-release device after a given interval of time, indicated by a hand moving over a dial, sufficient to enable the operator to leave the camera and, for instance, take up a position in the group or view being photographed.

The invention consists in a modification of an ordinary watch movement to provide a device of the above described type, the principal features of which consist of a sliding rod to operate the shutter-release, which rod is protruded by a pin on a rotating wheel, and a pivoted detent device for holding and releasing such wheel.

In the drawings *a* is the lens casing of a camera and *b* is the finger-release of the shutter thereof.

On the front of the camera in such proximity to the finger release *b* as to displace the same on complete protrusion of a rod *h* is mounted the contrivance *c* which forms the subject of the invention.

The contrivance is constructed by modifying an ordinary small keyless watch, as follows:—

The escapement is removed, leaving, however, the escapement train, which will exert a sufficient delaying action on the unwinding of the main spring.

The motion work, consisting of the cannon pinion, minute wheel, minute wheel pinion, and hour wheel, and the hour and minute hands are also removed.

Also for the usual dial, a dial bearing the numerals one to twenty is substituted (see fig. 1).

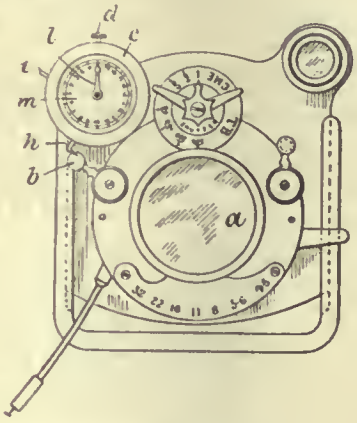
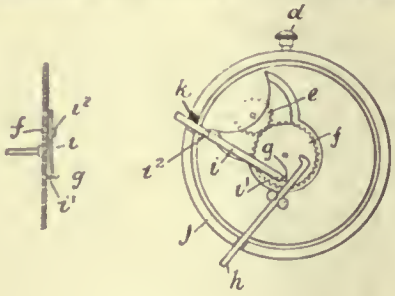


Fig. 1.

The barrel wheel, as usual, is rotated by the winding stem *d*, winding the main spring, which rotates the barrel.

A spur wheel *e* is secured on the barrel on the dial side of the watch case. This wheel *e* gears with a spur wheel *f* mounted free on the centre arbour of the watch. The wheel *f* has an outstanding pin or stud *g* (see figs. 2 and 4), at such radial distance from the centre of the wheel *f* as to encounter the inner end of and thrust outwards a sliding rod *h*, on rotation of the wheel *f*. This rod *h* is the device which on being thus completely thrust outwards angularly displaces the finger-release *b* and releases the shutter of the camera.

On further rotation of the wheel *f*, the pin *g* thereon escapes past the inner end of the outwardly thrust rod *h*, which latter is thereupon thrust inwards by the finger-release *b* on resuming its



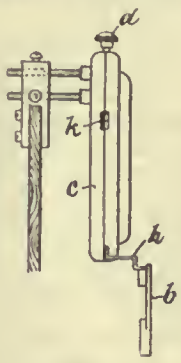


Fig. 4. Fig. 2. Fig. 3.

initial angular position under the influence of its spring.

After escaping past the end of the rod *h*, the pin *g* on the wheel *f* encounters the inner end of a lever *i*, pivoted at i^2, the outer end of which protrudes from the watch case, and the wheel *f* is arrested.

Slots for the protrusion of the sliding rod *h* and the lever *i* are provided by notches formed in the inner face of the bezel *j* of the converted watch *c*.

As may be seen from figs. 2 and 3, the slot for the protrusion of the lever *i* is lined on the side and end adjacent to the watch case and to the winding stem *d* respectively, with a strip of resilient material *k* such as rubber, which acts as a spring tending constantly to force the outer end of the lever *i* in directions away from the case and away from the stem *d* respectively. The result of this pressure by the resilient pad *k* is that the inner end of the lever *i* tends always to press towards the plane of the wheel *f* and also move angularly towards the centre thereof.

The inner end of the lever i is provided with a finger i^1, which, when the lever i is displaced angularly in a direction away from the centre of the wheel f, snaps into the intervals between the teeth thereof, by virtue of the inward tendency engendered in the inner end of the lever i by the outward pressure of the resilient pad k.

When the wheel f is in the position at which it is arrested by contact of its pin g with the end of the lever i, a hand l connected to the wheel f is situated over the numeral 20 on a dial m. This is in the initial position.

On pressing the lever i so that its inner end frees the stud g to pass beneath the same, the wheel f and the hand l commence rotating, the hand moving over the dial m in the inverse direction to the sequence of the numerals. When the hand has arrived at the numeral corresponding to the duration of the desired interval to elapse between release of the mechanism and the release of the shutter, the lever i is moved angularly so that its finger i^1 enters in the teeth of the wheel f and arrests the latter.

When all is ready, the outer end of the lever i is pressed towards the watch case, lifting the finger i^1 out of engagement with the teeth of the wheel f, and the yielding pad k forces the inner end of the lever i angularly towards the centre of the wheel f where it is in the path of the pin g. The mechanism starts, and during the interval before the pin g, after encountering the end of the sliding rod h, thrusts such rod h completely outwards, the operator can leave the camera and assume his desired position in the group being photographed or elsewhere.

The contrivance may be used for actuating the finger-release to close the shutter previously opened by a bulb or the like release to effect a time exposure. Thus the operator need not remain in proximity to the camera when taking photographs by time exposures, and, what is of greater importance, is relieved of the necessity of timing the exposure, such being done automatically by the duly set contrivance.—George Edwards, 120, Victoria Road, Queen's Park, London, N.W.6.

Colouring Photographs.—No. 130,896 (January 29, 1919). The invention has for its object to produce, by the use of oil-paints, a coloured picture which has the finished artistic appearance of a water-colour drawing, and which can be produced in a very short space of time.

The print to be treated is first coated with a suitable transparent preparation to form a ground for the oil-paints, preferably a mixture of one part xylonite in solution, two parts mastic varnish, and two parts pale drying oil, the parts being by volume.

A very small quantity of this mixture is used. For example, with a full-sized photographic plate six drops of the mixture would be sufficient, applied with a clean linen rag to the plate and spread evenly over the surface, leaving a thin film for working on.

If the print is an engraving or the like it is given a preliminary coating of xylonite in solution, which is allowed to dry before the application of the mixture above stated.

While the mixture is still wet the colours are applied to the print by means of oil-paints used very sparingly as stains, and not thinned in any manner, as the grounding affords sufficient thinning.

The picture is then allowed to dry in a room, or other place free from dust, at a temperature of approximately 70 deg. F., and is kept at this temperature for at least forty-eight hours, so that it is no longer sticky to the outer side of the finger.

A dressing is then applied to the surface consisting of powdered silica, which is dusted over it and rubbed on lightly until all trace of the gloss produced by the oil-paints is removed, leaving a dull matt surface, with the picture unaffected by the rubbing, and having the appearance of a water-colour drawing.

The quantity of powdered silica required for a full-sized photographic plate would be approximately 16 grs.

The silica dressing may be applied with the fingers in a circular motion completely over the whole surface, and continued until all appearance of oiliness has disappeared, after which the surplus silica powder may be removed with a broad camel-hair brush, and the picture wiped with a clean soft cloth.

When completed, it will be found that the finished print has the soft artistic effect of water-colour work, but it has the advantages of oil-colour painting—i.e., it is fast in colour, durable, and is proof against air, water and oil.—John MacDougall, 16, Claremont Square, London, N.1, and Samuel Thurley Thomas James, 8, Warwick Court, Gray's Inn, London, W.C.2.

Trade Names and Marks.

MARKS PLACED ON THE REGISTER.

The following marks have been placed on the register:—

Duogen.—No. 392,179. Chemical substitutes used in manufactures, photography, etc. The British Drug Houses, Ltd., 22-30, Graham Street, London, N.1, wholesale druggists.

Analecta.

Extracts from our weekly and monthly contemporaries.

Determining the Focal Length of Hand-Camera Lenses.

Hardly a month passes (writes Ralph E. Bail in "Photo Era") but some new method of determining the focal lengths of lenses appears in one or another of the photographic magazines. But so many of them require the use of double-extension bellows or focussing backs that the undermentioned method may be of interest, especially to users of hand cameras

Place a mark on the side of the camera in such a position that it lies in the same plane as the plate or film. Then, after racking out the bellows nearly as far as it will go, focus sharply on some flat object of such a size that its image on the focussing-screen will be 1 in. or so in length. In case a roll-film camera is used, the focussing may be done by stretching a piece of white paper across the rolls in the back to serve as a screen. Now measure the length of the object, the length of the image, and the distance between the object and image (this last measurement being made from the object to the mark on the side of the camera). The focal length of the lens used is then calculated from the equation

$$F = \frac{D \times O \times I}{(O + I)^2}$$

in which F represents the focal length of the lens, O the length of the object, I that of the image, and D the distance between object and image.

For a simple illustration: suppose the lens to be focussed upon a 12-in. rule, and, on measuring, the image is found to be 1 in. in length and the distance from the rule to the image 84.5 ins. Then the focal length of the lens would be $\frac{84.5 \times 12 \times 1}{(12 + 1)^2} = \frac{1014}{169}$ or 6 in.

New Books.

Design in Picture-making by Photography.—A little monograph by John Wallace Gillies on "The Significance of Design in Picture-making by Photography" has just been issued as No. 176 of "The Photo-Miniature" (New York: Tennant and Ward, 103, Park Avenue, 35 cents. London: Houghtons, Limited, 88-89, High Holborn, W.C., 1s. 6d.). The little book will doubtless draw the attention of photographers who have no sense of picture-planning to some of the principles which ensure pictorial attractiveness. But whether its author will carry that enlightened conviction which begets the happy assurance of an artist who knows his work is rather to be doubted. Mr. Gillies scarcely has enough to say about the principles he touches upon. He skims the surface and flies on merrily without so much as wetting his wings.

To explain the elusive things that go to make up art-feeling is intensely difficult. Still, it can be done, and perhaps the author of this brochure has achieved it as nearly as most, and better than many, who have set themselves to turn photographers into artists. But the little book attempts far more than its limits can compass. From this point of view, it is an advantage that the author restricts his theme almost entirely to design, which he calls pattern. Feeling he dismisses as something which "is there, or

is not, as the man has it, or has not; and it is for each one within himself to seek out and put that quality into his work." And that is all the reader gets about feeling, as far as its acquirement is concerned.

One of the best passages in the essay is that in which the photographer is assured that the sense of design will come into play intuitively if it is trained and cultivated; "then the placing and spacing of the picture on the ground glass is a matter of unconscious effort."

There are eight pages of illustrations, comprising photographic views, and versions by their side in pencil. These drawings are too far a repetition of the photographs to make much impression on the reader, and their completeness simply amounts to an alternative rendering of the same scenes. They would have had more instructive value in the form of diagrams. Print No. 3, a view of one of the great bridges over the East River at New York City, is an excellent picture, but, to our minds, its impressiveness is due to something quite apart from its design. The overwhelming height and length of the structure, and the sense of the distance covered in the span, are obviously the leading points of the picture. But they are due to linear and aerial perspective alone. The accompanying drawing misses all this, but gives the lines, which demonstrate that feeling or sentiment rather than "pattern" makes a fine picture of the photograph. Mr. Gillies says: "I think a more careful drawing of the subject would be preferable to the photograph in the matter of pictorial interpretation": an opinion to which we cannot subscribe.

The author has found, with many another photographer, that pattern seems to be more easily found in pointing the camera downward, "or using the skyline high in the picture space, as may be observed in the works of those pictorialists whose pictures show a keen appreciation of the interest of design." This is a practice more honoured in the breach than in the observance. It points to the lack of true pictorial insight, which leads people to look about for bridges and cranes and other ponderous structures, whose unrelenting lines they make into gawky compositions instead of discerning the less obvious masses of a complete scene, near and far alike, and welding them unaggressively in one harmonious scheme.

We can, however, recommend the little book as something to set the beginner thinking. F. C. T.

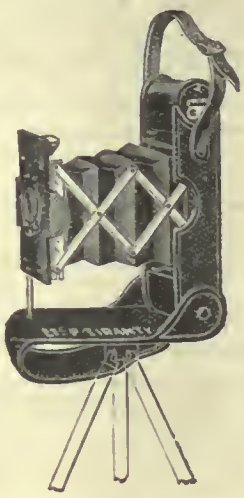
New Apparatus, &c.

Accessories for the Vest Pocket Kodak. Made by M. P. Tiranty, 103, Rue Lafayette, Paris.

The great convenience and efficiency of the vest-pocket Kodak have not unnaturally been the motives which have prompted M. Tiranty to extend its usefulness still further by placing upon the market a little accessory, which allows of plates being exposed in the camera without interfering with the independent use of roll film. This little apparatus, to which the name "Adapteplaque B.S." is given, consists of an additional back frame, which is applied to the rear portion of the vest-pocket Kodak, and is held

in place by a stout wire loop, which is passed over the extended front of the camera. It is understood that before placing the adapter frame in position the ordinary film-enclosing back of the vest-pocket Kodak is removed, and that the Kodak is, of course, employed uncharged with film. The plate adapter carries a single metal plate-holder for plates of 45 by 60 mm. size. The whole attachment is most simply used, and will no doubt contribute to the further popularity of the Kodak V.P. in the way of allowing of it being employed for ultra-rapid plates and for Autochrome plates. For the latter, M. Tiranty supplies a special pattern of dark-slide at prices from 3 to 5 frs. The price of the adapter for use with ordinary plates, and including three single metal plate-holders, is 25 frs.

A further very novel accessory for the vest-pocket Kodak is a case of light leather-covered metal provided with a hinged leather flap and leather carrying strap. The little Kodak is carried in this case, and when required for use the front portion of the case is turned downwards into the horizontal



position after the manner of the baseboard of a folding camera. The Kodak is thus held in position for exposures in the hand, or may be readily attached to a tripod by means of the stout metal bush, which is provided in the hinged front of the case. The little accessory is most ingeniously contrived, and is opened for use within a few seconds. It is supplied at the price of 25 frs.

CATALOGUES AND TRADE NOTICES.

Messrs. Griffin send us a four-page circular of their current introductions, including metol and amidol developers, their inverted gas lamp for enlargers, and Christmas greeting mounts for the forthcoming season.

The Adherent Tissue Company, 117, Fore Street, Upper Edmonton, London, N.18, have just issued a price-list of their dry-mounting tissue, presses, and accessories for the dry-mounting process. The list contains a table of temperatures recommended for the mounting of various descriptions of print with "Adherent" tissue.

Carbine and Maxim Cameras.—Messrs. W. Butcher and Sons, Camera House, Farringdon Avenue, London, E.C.4, have just issued a circular of revised prices of the Carbine and Maxim roll-film cameras. The former are issued in several models both in quarter-plate and postcard size, and Messrs. Butcher list a large variety of anastigmat lenses which can be fitted.

Brodrick Specialties.—Messrs. F. Brodrick, Limited, 50, High Street, Charing Cross Road, London, W.C.2, send us a sixteen-page price-list of their specialties in apparatus for professional photographers. Among these are the drying cabinet and developing tanks which we noticed in these columns some months ago. Other apparatus which is here newly announced is a cascade washing-table for prints in quantity, made according to an admirable design, and a combined hand printing and developing machine for four persons and a total output of 4,000 prints per day. All those engaged in the production of prints on a large scale will find this a list which describes thoroughly workmanlike appliances.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

MONDAY, NOVEMBER 24.

South London Photographic Society. "Versatility." R. H. Lawton.
Dewsbury Photographic Society. Discussion Evening.
Willesden Photographic Society. "Picture Making at Home and Out of Doors."
Bradford Photographic Society. "By Wood and Moorland up the Hebden Valley." S. Greenwood.
Bowes Park and District Photographic Society. "Personal Recollections; Photographic and Otherwise." —James.
Kidderminster and District Photographic Society. "The Giant's Causeway." G. Embrey.

TUESDAY, NOVEMBER 25.

Royal Photographic Society. "'No,' and Other Things Japanese." C. E. Crowther.
Hackney Photographic Society. "Northern Europe." Dr. C. Atkin Swan.
Doncaster Camera Club Demonstration. "A Chat on Pictorial Landscape Work." H. G. Grainger.
Chelsea Photographic Society. Selection of Prints for Affiliation Competition.
Birmingham Photographic Society. "Fonts and Their History." R. Hancock.
Manchester Amateur Photographic Society. Miscellaneous night.
South Glasgow Camera Club. Print Criticism.
Stalybridge Photographic and Scientific Society. "With a Camera in Holland." P. Rigby.

WEDNESDAY, NOVEMBER 26.

Croydon Camera Club. "How to Make Bromide Enlargements with the Club Lantern." The President.
Edinburgh Photographic Society. Whist Drive.
Dennistoun Amateur Photographic Association. "Titling the Print." E. W. Brooks.
Partick Camera Club. Lantern Slide Competition.
South Suburban Photographic Society. "Home Portraiture." P. R. Salmon.
British and Colonial Camera Club. "Colour Photography." E. T. Robins.
Photo-Micrographic Society. Members' evening.
Bristol Photographic Club. "Colour Photography." W. J. Pollard.

THURSDAY, NOVEMBER 27.

Rodley and District Photographic Society. Monthly Competition. "Church Interiors."
Hammersmith (Hampshire House) Photographic Society. N. E. Luboshez.
The Camera Club. "Choice of Subject and Composition." T. Williams, R.I.
Richmond Camera Club. "The Pictorial Advantages of Using Panchromatic Plates."
Brighouse Photographic and Naturalist Society. "A Week in a Varsity Town." E. S Maples.
Aston Photographic Society. "Aerial Photography."—Tate.
Wimbledon Camera Club. "Bromide Printing." The President. "Enlarging." The Hon. Sec.
Hull Photographic Society. "Chats on Paget Colour Photography." The President and A. N. Somerscales.
South Glasgow Camera Club. Enlarging and Working up Enlargements.

FRIDAY, NOVEMBER 28.

Royal Photographic Society. "How I Make my Bromoil Prints." G. B. Clifton.

CROYDON CAMERA CLUB.

If an expression of innocence be deemed to be an index to a character without guile, Mr. G. Bellamy Clifton, F.R.P.S., provides the proverbial exception so far as relates to his photographic enterprises. Admitted that he occasionally accomplishes most excellent "straight" photography, possibly owing to some crooked influence seizing the opportunity when the patron saint of all arch-fakers has adjourned round the corner to freshen inspiration, yet Mr. Clifton evidently feels happiest when advancing pictorialism by the introduction into Bromoils of deliberately drawn-in figures, or other accessories, as an important part of the composition. Realising that "he who excuses himself accuses himself," he offers no semblance of an apology for these buccaneering expeditions over the peaceful native soil of the camera, but, on the contrary, stoutly maintains that everything and anything is justifiable which tends to advance the expansive policy he has at heart.

Mr. Clifton's visit to Croydon last week with "Bromoil Printing" as his subject was fortunate in being early in the session, as a large number of new members have recently joined, many with but the vaguest notions regarding the process and its potentialities in the hands of a daring draughtsman.

Without going into details of a familiar process, several points raised by Mr. Clifton are of interest, particularly an allusion to an attempt now being made on scientific lines to standardise it. Bromoil, of all processes, he said, was the most temperamental; it could not be taught in the ordinary sense of the word, and every worker would have to find his own salvation. For instance, pigments and bromide papers working well in some hands might absolutely refuse to accede to the wishes of others. Contrary to usual ideas, he preferred to start with a flat and weak bromide print, and at a recent demonstration before a London society he was told that his procedure was wrong from start to finish, which encouraged him rather than otherwise.

He recommended a weak amidol developer, development being continued until all action ceases. He never heated any solution, but used all baths at the normal temperature of the room. "Williams'" bleacher and "Rawlings'" pigment (as supplied by Griffin's), with "Roberson's" medium, worked well in his hands, as did Ilford "Bromono" and "ordinary rough." When ordering, it should be distinctly stated that these bromide papers are required for Bromoil. All "non-stress" bromide papers were to be avoided.

Mr. Clifton then proceeded to give a practical demonstration, terminating it by pigmenting a bleached and fixed bromide print. Now the Croydon atmosphere is not flat or weak, the bromide print was, and apparently out of tune with its surroundings, for the picture began to appear as a negative. Grimly the lecturer's expression set, and a contest began, eventually resulting in a complete defeat of the entrenched picture, only a few shell-holes being finally left as evidence of the conflict. He stated in pre-war days bromide papers never behaved in this way.

In the discussion Mr. R. Dodd said the chemistry of Bromoil was very difficult. Personally, he believed that until a synthetic medium replaced gelatine regularity of results could never be hoped for, though a fair percentage of successes was always possible. Mr. R. E. Crowther, who had been investigating on scientific lines the most suitable type of negative, had stated that a very thin one was the best. "I get the very worst results from that type," here observed Mr. Clifton, smilingly. Mr. A. F. Catherine being possessed of a shaving brush too small for his massive countenance, had given Bromoil a fair trial, but was sadly disappointed with the process. Others spoke, all agreeing to disagree. A most hearty vote of thanks was accorded Mr. Clifton for a demonstration followed with keen interest.

During the interval a short discussion arose on the affiliation scheme for sending a loan collection of slides to Holland. The idea was not enthusiastically received. Noticing this, Mr. J. M. Sellors said he mentioned the matter, being bound so to do, but during the war, when he was at Falmouth, Dutch vessels used to put in, and their crews scoured the town for bacon. Consequently the inhabitants often went short. This recital put the lid on the scheme so far as Croydon was concerned, all agreeing that the appropriation of bacon to Dutch use, which might otherwise have found haven in the distinguished tummy of the honorary secretary, was nothing less than an outrage.

Commercial & Legal Intelligence.

EASTMAN KODAK COMPANY.—In addition to the usual quarterly dividends of 1½ per cent. (being at the rate of 6 per cent. per annum) upon the outstanding preferred stock, and of 2½ per cent. (being at the rate of 10 per cent. per annum) upon the outstanding common stock, the directors have declared an extra dividend of 7½ per cent. upon the common stock—all payable on January 2, 1920, to stockholders of record on November 29, 1919.

LEGAL NOTICE.—Notice is given of the dissolution of the partnership between Louis Myers and Marley Denwood, carrying on business as photographers at Stanley Street, Bury, Lancashire, under the style of "Romney's Studios." All debts due to and owing by the late firm will be received and paid by Louis Myers.

NEW COMPANIES.

BRITISH METAL PRINTING CO., LTD.—This private company was registered on November 10 with a capital of £10,000 in £1 shares (6,000 7½ per cent. cumulative preference). Objects: To carry on the business of metal printers, printers, lithographers, photographic printers, engravers, die sinkers, etc. The subscribers (each with one ordinary share) are: W. Rigby, 8, Newhall Road, Jericho, Bury, sheet metal worker; T. Rigby, 279, Rochdale Road, Bury, sheet metal worker; A. Rigby, 3, Bradford Terrace, Bury, sheet metal worker; W. Brown, 8, New Fields, Birtle, metal printer. The first directors are: W. Rigby, T. Rigby, A. Rigby, and W. Brown. Qualification, £150. Registered office: Britannia Works, Ormond Street, Bury.

News and Notes.

Successful Students.—At the last examination in photography held by the City and Guilds of London Institute two of the prizes and medals offered by the Salters' Company were awarded to Mr. R. P. Stewart and Mr. G. Beale, both of whom were students of Mr. Edgar Senior at the Chelsea Polytechnic.

Photographs of Soldiers' Graves.—Mr. Churchill recently stated in a reply to a question in the House of Commons that the total number of photographs of soldiers' graves supplied up to date for all theatres of war is 137,877, of which 62,875 have been supplied since the Armistice. There are 31,632 requests still outstanding.

Aerial Photographic Surveying.—In the House of Commons on November 10, Lieut.-Colonel Moore-Brabazon asked the Parliamentary Secretary to the Board of Agriculture what steps, if any, have been taken to utilise the experience obtained during the war in connection with aerial photography for mapping purposes towards assisting the Ordnance Survey work in this country, having regard to the fact that many maps are now out of date?

Sir A. Boscawen: The value of aerial photography for the purpose of map-making in the theatre of war is fully appreciated by the Ordnance Survey, and its application to peace surveys is being carefully studied, but at present the process is generally more expensive than normal methods and less accurate. The Ordnance Survey has full information on the subject, and is in touch with those who carried out air surveys on the Western Front and elsewhere. Some of these officers are now on the Ordnance Survey staff.

Royal Society of Arts.—Among the Cantor lectures to be delivered at the Royal Society of Arts after Christmas is a series of three on "Aircraft Photography in War and Peace," by Capt. H. Hamshaw Thomas, M.B.E., M.A., of Downing College, Cambridge, and formerly of the Royal Air Force. Photographers will also note with interest a paper to be read, also after Christmas, by Sir Cecil Hertslet, formerly H.M. Consul-General for Belgium and past-President of the Photographic Convention, on "The Ruin and Restoration of Belgium."

Recovering Silver from Fixing Baths.—According to "Abel's Weekly," Mr. Ackerman, chief of the photographic staff of the Caxton Company, of Cleveland, has invented a device for obtaining the silver from hypo baths. It consists of a combination of metals, which, when dipped into the hypo bath, set up a chemical action which precipitates the silver, which collects itself on the wooden frame holding the metal. The device is placed in the bath and left there indefinitely, working while plates are fixed. When enough silver has been precipitated it is scraped off. Mr. Ackerman has had great success with the process himself, and expects to market the device. Very little silver is left in the solution when it is ready to throw away. Another advantage is that the hypo bath with the device set in will last at least a third longer than without the silver remover.

Navy Service Photographers.—With a view to placing the photographic work of the Navy on a permanent footing, it has been decided to institute the non-substantive ratings of photographers, first and second class. Both the seaman branch and marines will be eligible. Candidates must have had previous experience in photography, and must hold no other higher non-substantive rating than gunlayer, second class. They must be recommended by their commanding officers as competent photographers, and particulars must be given of their previous photographic experience, especially in Fleet work, such as triangulation of fall of shot. The non-substantive pay attached to the new branch will be:—First class 1s., second class 6d. per day. Ratings previously employed on Fleet photographic work, and recommended for the new branch, who are not seamen or marines, may, if selected, be allowed to transfer to the rank of private, R.M.L.I. Six photographers will be selected immediately, and will be drafted to H.M.S. "Snapdragon" for service with the Atlantic Fleet. The requirements of photographic personnel in future, at home and abroad, are, however, under consideration, and further orders will be issued when these are decided, together with regulations governing the qualifications for first and second class rates. Ratings eligible for, and desirous of joining, the photographic branch should apply to their commanding officers. Recommendations should reach the Admiralty at the earliest possible date, and for the present are limited to ratings serving in home waters and the Mediterranean.

Permanence of Kallitype Prints.—Mr. David Bachrach writes to "Abel's Weekly" on this subject:—During my over fifty years' experience as a photographer I have handled and studied almost every kind of photographic print except gum prints, and have made the subject of permanence a study. The weakest of all photographic prints are the P.O.P. gelatine prints, and next to them are the old salted and silvered paper prints *not* toned with gold. They are more permanent when thoroughly toned with gold, fixed in fresh hypo, and well washed.

The Kallitype print is of about the same permanence as the old plain paper prints *not* toned A developed print, made on modern developing papers, is the most permanent of any silver image, as the metal is present in large quantity and more like the pure metallic silver of the old collodion process in making negatives. But they must be carefully manipulated to be permanent.

Those prints can be made almost as unchangeable as platinum prints, if thoroughly fixed, by toning them in the sulphide method, either in connection with a solution of hyposulphite of sodium or by the more direct method. Sulphide of silver is the most unchangeable of all silver products, and is not affected by the atmosphere. I have given these things most careful tests, years ago.

Now if the Kallitype prints can be made by some modification that will allow them to be toned by the sulphide process, they can be made about as permanent as the developed prints. I have no time or disposition to try the experiment, and I will leave that to the younger men to do.

Correspondence.

**** Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

**** We do not undertake responsibility for the opinions expressed by our correspondents.*

PHOTOGRAPHS OF THE NUDE AT THE ROYAL PHOTOGRAPHIC SOCIETY'S EXHIBITION.

To the Editors.

Gentlemen,—Your readers may be interested in an anonymous letter which I have received. Probably the writer has been brought up in a family where it was the custom to drape the pianoforte and table legs. His extreme sensibilities, however, did not prevent him from defrauding the Inland Revenue of a penny. This he accomplished by enclosing his written communication in a page of printed matter and that again in an open envelope bearing a halfpenny stamp.—Yours faithfully,

J. McIntosh, Secretary.

The letter is as follows:—

"Dear Sir,—I much enjoyed the Exhibition which you were kind enough to allow the public to see—with the *exception* of 1 or 2 pictures containing *nude females* from life. Those I think were too immodest and indecent for words, and most ladies hurried from them and most men who had brought ladies with them were sorry they had done so.

"If there *be* such a thing as *modesty* in the world, such pictures as those outrage it.—Yours faithfully,

"An Englishman."

"The Secretary,
"Photo Exhibition,
"Russell Square."

THE ASSISTANT QUESTION.

To the Editors.

Gentlemen,—There is something pathetically humorous about the letters on the "Eternal Question." Do the writers expect that a union for photographic assistants can be established by someone without the help of those interested? Now, if there is any desire to establish such a union, why do not some assistants call meetings in the large cities and towns, such as London, Glasgow, Manchester, Liverpool, Leeds, etc., etc.? Earnest men could easily hire small rooms and call meetings; or such meetings could be called to tea rooms or restaurants. Then, if it is possible to cut the cackle about grievances and get to business, a union could be started, and, once started, would grow, like the P.P.A. and other photographic societies. The P.P.A. has voted money towards the formation of a union, but no doubt looks to assistants setting the ball rolling. A union of photographic assistants could interest itself with the purely trade side, and also imitate the scores of technical societies in giving mutual help to amateur photographers, a point upon which many assistants would benefit greatly.—Yours faithfully,

Glasgow, November 16. PRACTICAL.

To the Editors.

Gentlemen,—I have followed with close attention the correspondence which has recently appeared in the columns of your journal, and would like to draw the attention of "Still Hoping," "Looking Forward," and also of Mr. Woodmansee, to the existence of a special photographic trade section which was formed under the auspices of the N.A.U.S.A.W. and C. in February of this year. It has absorbed the energies of several who have been acquainted with various unsuccessful attempts made in the past to establish an association of photographic assistants. Furthermore, it has secured recognition from a large number of employers, and has been invited by the Ministry of Labour to co-operate in the establishment of an Interim Reconstruction Council for the trade.

Its machinery has been adapted to cater for the professional, distributive, and clerical branches of the trade. The membership already runs into four figures, and it has secured an agreement of minimum wage rates and working conditions with at least nine of the most important firms. This agreement covers, amongst others, the assistants and clerical staff of Messrs. Kodak, Ltd., of Kingsway and depots.

Studio workers of the Army and Navy and other retail stores, works chemists, enlargers and other technical and professional operatives and assistants have taken up membership.

May I appeal to your correspondents and all others interested to communicate with me at the address stated? The non-indispensable character of the profession, referred to by "Still Hoping," need no longer be a barrier to the establishment of improved conditions. The Shop Assistants' Union has been in existence for over thirty years, and possesses a worthy record of constitutional but energetic activities. More than any other society it has been instrumental in obliging the Government to introduce a forty-eight hour working week Bill. Its most recent triumph in this connection was the securing of an extension of the Bill's proposals so as to include managers and assistants in responsible posts generally. This was the result of a consultation between Sir Robert Horne and Mr. John Turner, the Union's general secretary, with other T.U. officials.

Let all assistants in the photographic profession sink prejudice and link themselves up with a responsible and experienced trade union through the medium of a trade section established for and controlled by trade workers only.—Yours faithfully,

HARRY G. WARD, Section Secretary.

Dilke House, Malet Street, London, W.C.2.

MOUNTING BLOCKS TO POINT EMS.

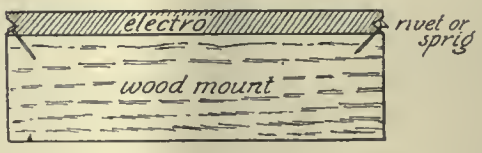
To the Editors.

Gentlemen,—Your remarks *re* mounting of letterpress blocks to inch measurements induces me to say a few words on the subject, as I am sure it is high time that labour-saving improvements should be attempted there.

Every process engraver and electrotyper would frown with indignation if they were charged with being incapable of mounting blocks *type-high*.

Now that the American point system has become indispensable to the jobbing printer he is more anxious than ever that the time-killing method of block-mounting as practised to-day shall be improved and the point system applied to economise time in justifying them to measure. Immediately the printer suggests this he is told "it cannot be done; wood is not reliable owing to shrinking" (he forgets it shrinks one way only), "that it is the custom to mount to inch measurements," etc., etc. These excuses are not trotted out when objection is made to a block not being type-high. This fault is tackled at once, and *remedied*.

From an experience of thirty years I can safely say it is as simple to mount a block to ems and ens as it is to make it type-high, or as simple as mounting to inch measurements. The average compositor will make any block given him to even ems or ens with the aid of a hack saw, file, and sandpaper. Since your remarks on this subject in the "B.J." only one block has appeared which presents any difficulty in carrying this system out, and that is in Illingworth's advt. (as page iv., September 19, 1919), where the brass rule joins up to the edge of the block. Even this can be overcome by using an electro and grooving the edge of the plate to allow the nails to be driven into the wood.



This would allow brass rule to join up flush on any of the four sides (see below for em measures in designing).

I first saw this method in an electro made in Germany, where there were no open spaces in the design to drive a rivet. This block was for use in fancy jobbing with rules and panels, and was quite accurate enough, and has been in use for years.

After spending several years at a school of technology and discussing the subject with students engaged in the process and electrotyping businesses, I am convinced that the reason why blocks are not made to ems instead of eighths of inches is lack of knowledge of the point system and block-mounting being relegated to unskilled and semi-skilled labour. How often is the printer annoyed to find the illustration, when placed in a page of type, all "awry," out of perspective, simply because vertical lines in the picture have not been kept parallel with the sides of the block; instead of this, one *edge* of the plate has been kept parallel.

This subject can be crystallised by an argument used by a process engraver, who said, "How can a block-maker make his mounts to picas when one printer's picas are different in size to another printer's picas?" This is equalled by another firm who wanted to know what I meant when I asked that a block should be mounted 18 ems by 12 ems American point body.

All that is requisite to remedy this chaos is for the block-maker to gain an elementary knowledge of the compositor's requirements and a general knowledge of the point system. Also to substitute one of Messrs. Stephenson, Blake and Co.'s type scales (which is a foot rule with inches marked on it and also ems and ens in 6 point, 8 point, 10 point, and 12 point). The block mounter would, of course, only need to use the 12 point em measures. The blocks could be mounted in inches as before, but the fractions would be sixths instead of eighths.

The block-maker who would first install this system would not only confer a boon upon the compositor in the saving of justifying, but also reap more business for himself. Any extra cost entailed would be worth paying by the printer.

Machinery would gradually be introduced to economise the block-mounter's time. The saw bench, or shooting block could be ruled in even ems, as a gauge for cutting, or the block could be clamped to the shooting block, which could be made to travel, like a lathe bed, past a revolving plane (vertical for finishing the edges of the block) or a revolving rasp. A Miller saw-trimmer is the nearest approach to this suggestion.

A good designer can fill any given space with appropriate design in

any given period or style of ornament. If this is true, why should not Bristol board, etc., be ruled out in even ems and a design made to fill a given number of them?

Similarly, the ground-glass of the process camera could also be ruled in even ems, just light enough so that they would not interfere with the sharpness of the image. If these suggestions were carried out the point system would work automatically as easily as the present system. Small blocks should be mounted on metal.

When the American point system was first introduced here it met with opposition and ridicule. One ring founder issued a catalogue pointing out the method in general use then as being much superior to the innovation. That particular firm to-day cast their types on American point bodies.

It is time the block-maker got a move on. As your journal is the acknowledged leader in the photographic world, I venture to think you will be interested in these remarks.

Apologising for taking up your valuable space, I remain, yours sincerely,

JOHN HURST,
Bronze Medallist, Photo-Mechanical Photog., Session 1910-11,
School of Technology, Manchester.
171, Lowfield Road, Stockport.

P.S.—We once had occasion to have a correction made in a line zinco block (size of block about 10 ins. x 8 ins.). The correction was set up in type, and an *ordinary* electro-plate made. The zinco-plate was cut away and the electro inserted and mounted in position with rivets or nails. Messrs. Taylor, Garnett, Evans and Co., Redditch, near Stockport, carried this out, and the electrotyper there (Mr. Evans) routed the block sufficiently low to allow both zinco face and electro face to stand type-high. If this fine cutting of wood can be done with the ordinary router in use, it is not an insuperable problem to improve the present system. The root of the problem is "the block-maker requires to know that six picas make one inch," and work to it.

Answers to Correspondents.

SPECIAL NOTICE.

In accordance with our present practice a smaller space will be allotted to replies to correspondents.

We will answer by post if stamped and addressed envelope is enclosed for reply: 5-cent International Coupon, from readers abroad.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

J. B. L.—About 8 ft. high and about 6 ft. from the sitter. Exposures with an *f*/6 lens will be somewhere in the neighbourhood of eight to ten seconds, but, of course, it is not possible to given even an approximate idea of the exposure necessary.

W. P. C.—The only suggestion that we can make is that you use glass plates, which are much less easily damaged, and, when you have got them satisfactorily into use, allow of prints stripping as readily as from ferrotypes. We should say glass is used by 90 per cent of the firms making glossy prints in quantity.

E. B.—The lenses are no good for regular photography, since they are not corrected achromatically. The eye-piece might be used as a long-focus lens with a small stop. We suggest that you should try mounting each lens separately in a tube made of successive folds of brown paper, and see what kind of image you can get with your camera.

M. T. K.—The office of the Retail Businesses (Licensing) Order for Hampshire is 5a, Union Street, Bristol. You are wrong in supposing that a licence under the order allows you to move about from place to place. It is issued only for a business in a particular place. You would want to apply for a new one every time you move.

M. R.—However much you may wish it, we are afraid you cannot make a distinction of name between men working the photo-copy processes and ordinary photographers. To engineers, for whom the former chiefly work, they are as valuable, in a different way, as the users of a camera. If we were you we should not worry over what seems to us a very trifling matter.

A. M.—The portrait lens is the worst kind of lens for outdoor work, such as groups, etc., as it has poor covering power, and stopping down does not improve it much in this respect. Your best choice is the Ross or the Busch lens. The latter, though called a portrait aplanat, is not a portrait lens of the ordinary kind. We think the prices are not far from the mark at the present time.

H. J. C.—The Raydex of Raydex, Ltd., 71, Lavender Hill, S.W.11. Their booklet of instructions is quite full, and will give you a good idea of the process. The only other two processes of any kind are the Paget and the Autochrome for the making of colour transparencies. Literature relating to these is obtainable from the Paget Prize Plate Co., Watford, Herts, and from Mr. Thos. K. Grant, 89, Great Russell Street, W.C.1.

G. S.—It seems to us that the real question at issue is what is a satisfactory profit to you on the enlargement. Your customer can naturally see for himself in, for example, Raines's catalogue the price which he would have paid them for admittedly first-class work. If that price is considerably lower than yours, the only point which it raises is the proportion of profit which seems necessary to you. That, obviously, is a question which it is impossible for us to deal with.

S. S.—Nothing that you tell us in your letter indicates that you have done anything to part with your copyright in the photographs, and therefore any sale or distribution by way of sale will be an infringement of your copyright and will be actionable. Any dispute which you may have as to your liability to pay for the cards at an enhanced price is an altogether separate matter; the people cannot legally retaliate by making any use whatever of the cards which have been printed.

T. R. G.—The staining is no doubt due to insufficient fixing. With many papers at the present time it is absolutely necessary to put prints through two fixing baths in succession. Very likely also the defect has been aggravated by low temperature of the fixer. If you make it a rule to use two baths, giving the prints ten minutes in each, and at the same time see that the solutions are not colder than 60° to 65° F., we think you will find that prints will no longer be defective.

C. E. F.—Your whitewash was far too thick, and you laid it on too heavily. The chrome alum has made it waterproof, but you can get it off by soaking with vinegar and rubbing with the distemper brush. The vinegar stains a little, but if you got some commercial acetic acid and diluted it you could probably get off a good deal of the white without staining; you would not have to re-coat then. A little sugar in the distemper would prevent cracking.

G. W. C.—The only half-watt lamps which we have used for photography are the Atmos type, made by the General Electric Company. The company has a special department for photographic lamps, and inquiries should be addressed to it at 67, Queen Victoria Street, London, E.C. Other makes of lamp may be equally good, but we cannot speak of them from experience. We cannot give exact current price for the lamps and fittings, but we hear that they have recently been reduced.

L. J.—If on the previous occasion you simply granted rights of reproduction in a single issue of the paper, then certainly the newspaper is liable to pay you a further fee in reference to the recent publication. This assumes that your invoice on the previous occasion was drawn up strictly, and could not now be interpreted as a general assignment of copyright. This is a matter dealt with at greater length than we can do in a letter in the little manual "Photographic Copyright," issued from this office.

R. L. H.—1. It is only common prudence to employ a lawyer to draw up an agreement of partnership. It is less necessary in the case of the purchase of a business, although in some circumstances legal advice is certainly advisable. 2. The 10-in. Planar was listed to cover a 7½ by 5 at full aperture, not 12 by 10. The lens has never been a popular one, and even now, with the present enhanced prices of second-hand lenses, is not worth more than half its original list price, which was £21 10s.

A. S.—If the negatives intensified with mercuric iodide are re-developed they are of a high degree of permanence, but if not re-developed are liable to go yellow in the course of months or years, although they remain quite good printers. The iodide formula in the "Almanac" does not give such great intensification as that with mercury ammonia, but there are other mercuric iodide formulæ which we have published in the "Journal" and "Almanac" from time to time which give a much greater amount of intensification.

J. H.—1. Impossible to say without reference to a particular subject. With some colour subjects the panchromatic result might be superior to that with N.F. plates, with others, vice versa. 2. Best after prints have been washed for at least half an hour after fixing. If this cannot be done on account of blistering or frilling, the best plan is to use a hardening-fixing bath. 3. We are sorry we have no data of the factor for the "B.J." pyro-soda developer. 4. No harm results through the broken glass remaining in the bottle.

E. M.—We think you will be running considerable risk in adopting the name "K Studio." The present proprietor, although he may not trade as the "K Studio," undoubtedly acquired (when he bought the business) any goodwill or connection which accrued to him and still benefits him from the previous use of the words "K Studio." If now you use this title we think he will have good ground for taking action against you. Obviously, it is open to you to do what you can to benefit by your previous connection with the "K Studio" without actually taking the name of the latter.

A. K.—1. Licences for businesses in Chester are dealt with at New Arts Buildings, Liverpool. 2. It should be simply a matter of form in the case of an ex-service man. The object of the Order is to safeguard such men as yourself from interlopers starting businesses in their absence. Each case is investigated on its merits. The office has not published any conditions of the granting of licences. 3. Allowing 5 ft. for the sitter and for the photographer behind the camera, the minimum studio length for full-length cabinets with an 8½-in. lens is 16 ft. With a 10-in. lens it is 20 ft., and with a 12-in. 24 ft.

B. E.—The dark marks in the prints are plainly due to local imperfect fixation. You can see that such is the case in one specimen from the fact that the patch has a straight line where one print has lain upon another in the fixing bath. We advise you to use a stronger fixing bath than you are doing, namely, 6 ozs. hypo to 20 ozs. water, and to use two baths of this strength in succession. Bath No. 2 should be fairly fresh. As soon as it has been in use for some time it may replace bath No. 1, and a fresh solution taken for No. 2. We think if you do this you will have no further trouble from this cause.

C. F.—1. As the studio is rather low, the best installation for your purpose is either one of half-watt lamps or the inverted top-light arc of the Westminster Engineering Company, Victoria Road, Willesden Junction, London, N.W. For full-length cabinets in a studio of only 17 ft. in length, the longest focus of lens which you can use is 8½ inches, that is allowing 5 ft. altogether for space behind the sitter and behind the camera. If you can contrive to dispense with, say, 2 ft. of this space, you could use a 10-in. lens, which would be a good deal better. 2. You require a licence, the office for which is 15, Athol Crescent, Edinburgh.

K. D.—We think it is very doubtful if the staining effect of the metal coating will disappear by use of the tank. It is impossible to say what will remove the stain, for we imagine that the stain-removers which might serve for stain from developer will be quite useless in this case. Apparently the only remedy for what has been done is to have the trough given a thorough coating of some varnish such as asphalt, which will protect the metal from the fixing bath. Even this is not likely to be thoroughly permanent, particularly if acid fixing baths are used in the trough. It seems to us that it is a case where the repairer should be required to make good the damage he has done.

F. G. F.—So far as we know there is no exact rule or ratio as regards the relative preservative power of sulphite and metabisulphite. Roughly, metabisulphite used instead of sulphite in a developer will give as good preserving effect if its quantity is one-quarter that of the sulphite—*e.g.*, you can certainly replace 8 ozs. of sulphite by 2 ozs. of metabisulphite, probably by considerably less metabisulphite, though the effect varies, we think, with different developers. But as metabisulphite is very much less soluble than sulphite, it does not help matters much as regards making a more concentrated developer. As a matter of fact M.Q. is not well adapted for preparation in very concentrated solution, and we do not think you will find it practicable to make up stronger solutions than those in, for example, the Imperial M.Q. formula.

V. A.—Evidently the copyright was created under the old Act according to which copyright lasted for the life of the author (your father) and for seven years after his death. Therefore, if your father died seven years before the present Copyright Act came into force—namely, in June, 1912—copyright in all the works which he made has expired, and there is no means of re-creating it. But if your father died less than seven years before June, 1912, copyright may perhaps be prolonged and still be in existence, for the reason that the term of copyright which existed at the time the present Act came into force is determined (according to the new Act) as though this new Act were in force at the time the photographs were taken. According to the new Act, copyright lasts for the definite period of fifty years. From these particulars you should be able to find out for yourself whether copyright still subsists in the photographs taken by your father. You will find further particulars, as regards transfer of ownership, etc., in the manual "Photographic Copyright," issued by our publishers.

P. T.—It is not practicable to give a definite formula for the iodine-cyanide reducer owing to the great variation in the commercial strength of cyanide, but we can prescribe a working formula which you can apply to such materials as you can purchase. Make a 10 per cent. solution of potassium cyanide, and buy, if you can, the ordinary tincture of iodine from the druggists. If you cannot buy this, dissolve flake iodine in rectified spirit or methylated spirit to a 5 per cent. solution. To make a working reducer, take now, say, 4 oz. of water, add about ½ drachm of the cyanide solution and then the iodine solution a few drops at a time as long as the iodine is decolourised by the cyanide. As soon as a faint yellowish colour persists add a drop or two more of cyanide to remove it. The mixture will be an iodine-cyanide reducer, which very likely may act somewhat too quickly, in which case add water as required to slow its action. If, on the other hand, the action flags, add more cyanide cautiously, and, if that is not sufficient to energise the reducer, add still a little more iodine.

The British Journal of Photography.

The Oldest Photographic Journal in the World.

PUBLISHED EVERY FRIDAY. ESTABLISHED 1854. **PRICE TWOPENCE**

TERMS OF SUBSCRIPTION, POST FREE.

UNITED KINGDOM.—One Year, 10s. 10d.; Six Months, 5s. 5d. Three Months, 2s. 9d.

CANADA	*One Year.*
AUSTRALIA	
NEW ZEALAND	
SOUTH AFRICA	Thirteen shillings (13s.), or 3 dollars 17 cents, or 22 francs, or 9 rupees 12 annas, or 6 yens 30 sens.
UNITED STATES OF AMERICA	
SOUTH AMERICA	
INDIA AND FAR EAST	
CONTINENT OF EUROPE ...	

FEDERATED MALAY STATES, BORNEO AND SARAWAK 5 dollars 57 cents.

HENRY GREENWOOD & CO., LTD., Proprietors and Publishers, 24, Wellington Street, London, W.C.2.

IMPORTANT NOTICE TO READERS.—Until further notice agents will supply the "B. J." to order only, as the high price prevailing for everything in connection with newspaper production prohibit the distribution of surplus copies for chance sales. It is therefore necessary in order to ensure the regular delivery of the "B. J." each week to place an order definitely with a dealer, newsagent or bookstall clerk, or to send a subscription to the publishers.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3108. Vol. LXVI. FRIDAY, NOVEMBER 28, 1919. Price Twopence.

Contents.

	Page
Ex-Cathedra	689
Callitype: Photo-Mechanical Reproduction of Letterpress	690
Dodging the Working-up. By Thermit	691
Practicus in the Studio. By Practicus	692
Spotting Prints. By S. H. Avery	694
An Elementary Survey of the Present Position of Aerial Photogrammetry. By P. R. Burchall, Squadron Leader, R.A.F.	695
A Flush Handle for Cameras, Instrument Cases, and Lantern Slide Boxes. By Vivian Jobling	697
Assistants' Notes	698
Patent News	698
Meetings of Societies	700
Commercial and Legal Intelligence	701
News and Notes	702
Correspondence— Quantity One-Man Tank Developers—Measuring Focal Length—The Assistant Question	702
Answers to Correspondents	703

SUMMARY.

A contribution by Major P. R. Burchall, Squadron Leader, Royal Air Force, provides a useful elementary survey of the technical conditions as regards apparatus, aircraft and optical equipment requiring to be fulfilled in any system of aerial photogrammetry. (P. 695.)

Methods of colour-sensitising gelatine emulsions with auramine alone or in conjunction with an isocyanine are the subjects of two recent patent specifications. (P. 699.)

The chapter in the "Practicus" series this week deals further with the carbon printing process, and consists of a large number of hints representing the experience of a very practised worker of the process. (P. 692.)

In a leading article we refer to the combined use of typewriting and processes of photo-mechanical reproduction now being made by New York publishers in the emergency created by the industrial dispute in the printing trade. (P. 690.)

Mr. Vivian Jobling describes and illustrates a neat fitting for camera or lantern-slide boxes in the shape of a flush handle. (P. 697.)

A practical paper on the spotting of prints is quoted from our Boston contemporary "American Photography." (P. 694.)

Hints on the choice of a hand-camera for professional use are contributed to "Assistants' Notes." (P. 698.)

Some of the means which should be taken to reduce the quantity of working-up on prints are dealt with in an article on page 691.

The death is announced of Mr. S. D. Chalmers, head of the Department of Technical Optics at the Northampton Polytechnic Institute, Clerkenwell. (P. 702.)

Mr. E. W. Parfitt suggests photographing the sun's disc as an interesting method of measuring the focal lengths of lenses. (P. 702.)

Society secretaries who have not yet sent in particulars of their associations for the directory of societies in the forthcoming "B.J. Almanac" are asked to do so without delay. (P. 689.)

The Photographic Fair organised by Mr. Arthur C. Brookes will be held from April 16 to 24 next. (P. 689.)

Some of the causes of white spots on prints from air-bells are the subject of a paragraph on page 690.

An indispensable instrument in the fixing of prints is a paddle of ebonite or hard wood by which each print can be fully immersed on first being put into the fixing-bath. (P. 690.)

Photographing wall tablets, prints for reproduction, exposures in Press photography, repairs of apparatus, and the provisions of the Retail Businesses (Licensing) Order are the subjects of brief replies to correspondents. (P. 703.)

EX CATHEDRA.

Fair and Congresses. It is now announced that the Photographic Fair organised by Mr. Arthur C. Brookes, of our contemporary, the "Photographic Dealer," will be held at the Horticultural Hall, Westminster, from April 16 to 24 next. Mr. Brookes states that many applications for space by photographic firms have already been received, and that those wishing to be represented at the Fair should communicate with him at as early a date as possible at Sicilian House, Southampton Row, London, W.C.1. During the period of the Fair two congresses will be held and will have their headquarters at the Horticultural Hall. One is that of the Professional Photographers' Association, suggestions for which are invited from its members by the secretary (Mr. S. H. Fry, Frisian House, 5, Highbury Grove, London, N.). An exhibition of professional photography will also be held in conjunction with the P.P.A. Congress. The other conference is that to be arranged by the Photographic Dealers' Association. Its secretary (Mr. A. Oglesby, 37, Bedford Street, W.C.2) will likewise welcome any suggestions of subjects for discussion or features of the congress of particular interest to those engaged in the sale of photographic requisites. With all these attractions timed to be forthcoming within a single week there should be no uncertainty that the Fair itself and the meetings of professional photographers and photographic dealers will secure a full measure of success. Incidentally it should be mentioned that the Chemists' Exhibition will be open on one of the days during which the Photographic Fair is being held at Westminster.

* * *

Directory of Societies. The directory of photographic societies which we compile each year for the "British Journal Almanac" is now very nearly completed for the 1920 edition. We have, however, still to receive particulars from a few societies. Apparently, in the case of some secretaries it is necessary to make application a second and a third time in order to arouse realisation of the fact that a big book like the "Almanac" must close its pages by a definite date in order to ensure punctual publication. Perhaps unwisely, we give society secretaries a longer period of grace than any other class of persons represented in the "Almanac." When every allowance has been made for the transfers of secretaryships as a consequence of the engagement of men during the war, we cannot but think that there is a certain laxity in supplying particulars the publication of which is bound to be of, at any rate, some advantage to a society. In some cases secretaries are good enough to credit us with powers of divination. They return our form simply with the intimation "Particulars as last year," but omit to

tell us the name of the society to which their message relates. In instances such as this, as well as in those where no answer whatever is forthcoming, we are bound to follow our usual custom and to insert the name of the society, followed by the advice that particulars of its present officers, time and place of meeting, etc., have not been ascertainable.

* * *

Import Legislation. So far as can be gathered from a first reading of its complex text, the Bill now before Parliament which is popularly referred to as the Anti-Dumping Bill proposes to stabilise the emergency regulations as regards the importation of certain foreign goods to which reference was made in this column in our issue of August 29 last. Under the Bill the importation of certain goods may be prohibited. These goods are itemised in a schedule to the Bill, and are seen to include synthetic photographic chemicals (pyrogallic acid is specially mentioned, among other organic chemicals) and optical glass, including lenses, prisms, and like optical devices. While it is out of the province of a technical journal to discuss the political aspect of such measures as these, it may certainly be said that the Bill promises to arouse a great deal of opposition, and already its provisions are being made one of the chief features of a by-election. Many who have been convinced Free Traders have, as a result of the war, brought themselves to favour some policy of exclusion directed against enemy goods, but such, of course, is not the purpose of the Bill, the provisions of which, so far as they concern prohibition of importation, are directed against goods of any alien origin. Further comment than this must be postponed until the provisions of the measure are more adequately explored in the course of debate in the House of Commons.

* * *

Bubbles. Much unnecessary work is caused in the finishing of bromide and gaslight prints by allowing minute air-bells to form upon the surface during development. Very often the cause of the tiny white spots is not recognised, as they are attributed to dust upon the negative or even to imaginary defects in the coating of the paper. The most prolific cause is careless wetting of the paper before development. It is a common practice when developing enlargements to place the exposed paper in a dish, and to turn the tap upon it to make it lie flat and to cause the developer to flow evenly. In these circumstances the water becomes charged with tiny bubbles which adhere to the paper and cause the defect complained of. The remedy is to swab the surface with a pad of cotton-wool either while in the water or immediately after immersion in the developer, when the bubbles will be broken and the solution allowed to act properly. Even if the paper be not wetted before development bubbles may be produced by diluting the developer with water drawn from the tap and not allowing time for the bubbles to rise and break. This may occur when a single solution such as Azol is used, or with concentrated stock solutions of amidol or metol-hydroquinone. It may be well to add that bubbles are less likely to appear when a liberal quantity of developer is used than when there is only just enough to cover the surface.

* * *

Print Paddles. A great help to clean working in bromide print is found in the use of a print paddle. This is a rod with a flattened disc or ring at one end, its use being to push the prints well under the surface of the fixing solution, and to move them slightly, without having to contaminate the fingers with hypo. Such instruments have been made in celluloid, but these were rather light and small for professional use, and most printers have improvised something on their own account, very often a piece of absorbent wood which has rapidly become saturated with hypo and useless for its purpose. A shade better than this is a large wooden spoon about 18 ins. over all, which has been well baked while new, and then saturated with paraffin wax. This is less absorbent, and the rounded bowl is excellent for dabbing on the prints. Effective paddles have been made by taking a stout brass wire, covering it with a pure rubber tube and bending it into the desired shape, the ends when joined being covered with the rubber tube made hypo-proof with patching rubber and solution. Gutta-percha is rarely met with now, but an ideal paddle could be made of gutta-percha tube, which is stiff enough to need no metal support, and even less acted upon by chemicals than rubber.

CALLITYPE: PHOTO-MECHANICAL REPRODUCTION OF LETTERPRESS.

One of the results of the deadlock in the New York printing trade has been the resuscitation of a method of "setting" letterpress according to which use is made of photo-mechanical processes for producing the printing surface. The method has been the subject of articles in some of the New York newspapers, by whom it has been described as a sudden discovery, made for the purpose of providing emergency means for the production of newspapers without the aid of hand or machine type-setting. As a matter of fact, both the idea and the first practical application of it are nearly twenty years old. It was in 1901 that a printer, Jacob Backes, devised the system of "setting" letterpress on a typewriter and of making from the type-written original a printing surface by a photo-mechanical process. Mr. Backes, who is still living, gave to this process the name "Callitype," not a very descriptive title, since it means simply "beautiful type." It is, of course, simply another form of the same name (Kallitype) applied to a process of photographic printing with sensitive iron salts, which is still fairly familiar to photographers. It is difficult now to conceive the motive which could have prompted Mr. Backes to have devised an alternative system to ordinary type-setting. At any rate, he produced a periodical called the "American Callityper," several issues of which made their appearance. Speaking from memory we think it was one of these which formed the subject of an appreciation in the "Photogram," whose editor, the late Snowden Ward, with characteristic optimism and enthusiasm, hailed the new departure as a revolution in the production of letterpress periodicals, and as providing an immense new field for the commercial application of photo-mechanical processes. So far as we know, however, nothing more was heard of Callitype until the recent printing dispute in New York provided the occasion for the employment of a process by which publishers could produce printed matter of a kind in circumstances which deprived them of the use of hand-set or machine-set type.

Apparently very few of the New York publishers affected by the strike have turned to utilise this emergency process. We have received only two periodicals for which it has been used, namely, the "Literary Digest" and the "Scientific American." The former, which was the first to employ the method, has its letterpress "written" on a typewriter and photo-engraved line blocks made from such originals upon a somewhat reduced scale. In the case of the "Scientific American" the type-written letterpress is reproduced, apparently on the same scale as the original, by means of photo-litho transfers on to the lithographic stone, the edition of our contemporary being thus run off

on lithographic presses, whereas, presumably, a typographic press is used for the "Literary Digest."

In view of the fact that these means must have been devised at extremely short notice the printed result may, perhaps, be considered fairly satisfactory. At any rate it is clear and readable, and in the case of the reduced reproductions used by the "Literary Digest" does not impress the reader as something altogether different in kind from ordinary type-setting. But in both cases the matter suffers from a defect which arises from the process, and evidently is one which is inevitable in any system of preparing letterpress in the first instance on a typewriter. However carefully the original manuscript may be copied by the typist, it is impossible that the line should end with the same mathematical alignment that is secured in hand or machine setting. The compositor who sets type by hand obtains this exactly equal width of each line by the insertion of "leads" of suitable width between the various words. In setting matter on the Linotype machine, the same result is secured by an extremely beautiful and automatic mechanical device which can best be described as consisting of a series of tapering pieces which are thrust upwards between the separate words in a line, pushing them out to correspond with the limits of the type-space on each side. The Linotype operator has thus only to judge, slightly in advance, the point at which he shall break his line; the machine then comes into action when the line is completed, giving it the exact width which has been chosen for the setting. It is inconceivable that even a typist possessed of the most exceptional powers of judging how to space and divide each line could ever equal the exactitude of the alignment on the right-hand of a printed column which is obtained without any difficulty whatever by the ordinary methods of type-setting. On this ground alone it may be thought that while Callitype may serve the purposes of an emergency it is never likely to prove a serious competitor of the compositor. Standards of form and precision in printing have become so high that the necessarily ragged right-hand edge of a column of letterpress reproduced from a Callitype original is certainly anathema to the printer, and would surely meet with the disapprobation of a large section of the public.

DODGING THE WORKING-UP.

The production of a good enlargement usually incurs an amount of hand work, sometimes extensive, on either the negative, the dry enlargement, or on both. The greater part of this work might with advantage be replaced by chemical work and by control of the enlargement during exposure.

In the case of hard or flat negatives it is obviously easier to reduce or intensify than to obtain the necessary softness or contrast by means of brush and pencil. When neither reduction nor intensification fits the case, and yet the negative is wanting, perhaps a new one from a glass positive will prove worth while. It sometimes happens that part of a negative only is at fault, the background of a portrait study is too strong, or certain figures in a group are harsher than others, or more prominent. In such cases, effective results can be obtained by blocking out the good portions (on the glass side) and making a very thin transparency of the negative. When this is dry it is bound in register to the negative (the latter having been cleaned of the blocking-out paint) and an enlargement made of the combination.

Any degree of correction, even to a level grey, can be obtained this way; the depth of the transparency decides the degree.

For mechanical treatment during exposure some pieces of thin art mounting, some transparent white paper—similar to that used for negative bags—a piece of fine black netting, another of white mosquito netting, some fine iron wire, a sheet of plate-glass free from flaws and scratches, and a white glass-headed hat-pin will all be found useful.

A most serviceable aid when "dodging" is a vignette holder in the form of a wooden frame mounted on a stand. Made of 2-in. wood, the frame should be of a diameter equal to the length of the largest size commonly made. The base measurements are such as to allow stability with sufficient height to bring the centre of the frame level with the normal position of the lens when the accessory is standing between the lens and the easel. With such a support, far more can be accomplished in the way of vignetting, combining, shading, diffusing, and dodging than can be done with the hand alone, and the operations can be performed with a precision that is impossible when working without a support. It sometimes happens that part of an enlargement requires dodging throughout the exposure, while another part needs treating for a fraction of the time only. In such cases the frame will take one half the dodging off one's hands, leaving them free to attend to the more delicate bits.

All this sounds more suitable to trade and commercial work than any other kind, and certainly they offer more scope for "dodgments" than studio portraiture does. With the latter, negatives can be standardised more easily, and the need for correction obviated. As a matter of fact, however, skilful control of enlargements is a valuable work anywhere, and of particular value when dealing with copies.

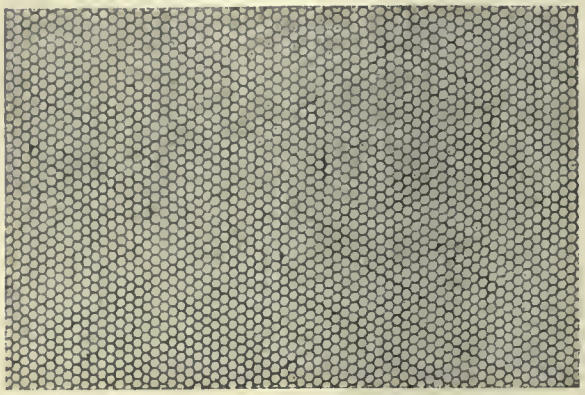
To return to the stock-in-trade, the art mounting has an advantage over ordinary cardboard, inasmuch as it is easily cut to exact shapes for delicate jobs, and at the same time it can be torn for broad vignettes, the fluffy edge being an advantage.

The transparent paper is useful for eliminating part of a picture with the minimum of trouble. For instance, to remove a figure from a group, instead of knifing away the negative or painting out and subsequently aerographing, a vignette is cut so that when laid on the easel it will closely fit the figure which is to be removed. A piece of the transparent paper is cut to the same size and shape as the vignette and fixed with a small trace of gum to the sheet of glass, which has been previously reared against the wooden frame, midway between lens and easel. The paper is placed so that it just diffuses the image of the unrequired figure. To do this it may be necessary to move the frame and glass close up to the easel, and any stopping down should be done first, as the lens aperture controls the effect to some extent. The vignette is held over the figure while an extra exposure is given. This is necessary to compensate for the opacity of the diffusing paper. The result on developing should be a soft grey patch which the b. and w. artist can easily work into the background (or leave alone altogether). The black netting, stretched on the frame with four push pins and placed half-way between easel and lens, will save half the spotting of a large picture or smoothing of a face. To get the maximum effect without appreciably softening contrasts or focus, the size and kind of mesh illustrated should be used. The white mosquito netting will decidedly soften the picture besides smoothing out spots.

The wire is useful to hold cut pieces of card or paper to shade parts of a picture during exposure. The cards can be hung from the frame with drawing pins, and so easily ad-

justed to a nicety. Similar effects can be obtained by using neutral tint water-colour on the glass sheet.

A glass-headed hat pin occasionally comes in handy to print in a dark spot such as the pupil of an eye, but it must be



Actual size illustration to show suitable mesh of black diffusing material.

used with extreme care, or it will defeat its own object. Invaluable in odd cases, careful tests have to be made before using this dodge on one's last sheet of 30 x 40.

Combination pictures can easily be made by the aid of a piece of art mounting cut in two. Each half should be capable of covering that half (of one of the negatives) that is not required. One cut only must be made; whether straight or otherwise, no trimming is permissible. Having focussed up the required part of one negative on that part of the easel where the image is desired, the unwanted portion is vignetted off with the cut edge of the correct card, which is securely pinned to the frame. After making the exposure and covering the paper—without disturbing its position on the easel—with a thin sheet of black paper, the negative is removed and the other one put in its place. Then the other half of the out card is pinned on the frame with its cut edge exactly coinciding with that of the other. When the join is made as perfect as possible, the first card is carefully removed. The frame must not be disturbed all this time. The second negative can now be focussed up, using a piece of white paper held against the black to focus on. If these operations are carried out with care and the exposures correctly calculated, there will be no trace of the join in the developed enlargement.

In the same way narrow pictures—particularly if they contain water or grass—can be made square, and *vice versa*. Skies and foregrounds can be extended vertically and mountain ranges horizontally. Of course, this means repeating some part of the picture or bringing in some other negative, but both dodges are useful when it is required to fill a given size without cutting anything off, and the dodges, if carefully engineered, are seldom suspected.

The above-mentioned dodges are mostly applicable, under slightly different conditions, to copying, it being quite as practicable to shade or vignette a negative during exposure as it is to treat an enlargement. In some ways it is easier, as the effect can be fairly well judged on the ground glass; and also, as plates, on account of their greater latitude, seem to lend themselves more to this kind of work than papers do.

THERMIT.

PRACTICUS IN THE STUDIO.

[Previous articles of this series, in which the aim of the writer is to communicate items of a long experience in studio portraiture, have appeared weekly since the beginning of the present year. It is not thought possible to continue the series to the length of that by the same writer which ran through the "British Journal" some years ago, but if any reader among the younger generation of photographers, and particularly those engaged as assistants, has a particular subject which might be dealt with, his or her suggestion will be welcomed. The subjects of the previous articles of the series have been as follows:—

A Talk About Lighting (Jan. 3).
The Camera and the Lens (Jan. 10).
Managing the Sitter (Jan. 17).
Backgrounds (Jan. 24).
Studio Exposures (Jan. 31).
Artificial Lighting (Feb. 7).
Printing Processes for Portraiture (Feb. 14).
Studio Accessories and Furniture (Feb. 21).
The Surroundings of the Studio (Feb. 28).
Studio Heating and Ventilation (March 7).
The Postcard Studio (March 14).
The Printing-Room (March 21).
About the Reception Room (March 28).
Home Portraiture (April 4).
Portable Studios (April 11).
Copying (April 18).
Handling the Studio Camera (April 25).
More About Lenses (May 2).
Enlargements (May 9).
Advertising the Studio (May 16).
Mounts and Mounting (May 23).
Business Methods (May 30).
Photographing Children (June 6).
Portraits of Elderly People (June 13).
Something about Lenses (June 20).
Hand Cameras for Professionals (June 27).
The Dark-Room and Its Fittings (July 4).
Plates and Their Work (July 11).
Apparatus Repairs and Renovations (July 18).
Posing the Head (July 25).
Intensifying Portrait Negatives (Aug. 1).
Workshop Jobs (August 8).
The Personal Factor (Aug. 15).
The Keeping of Negatives (Aug. 22).
Reduction of Negatives and Prints (Aug. 29.)
Leaky Roofs (Sept. 5).
Blinds and Curtains (Sept. 12).
Miniatures (Sept. 19).
Printing Portrait Negatives (Sept. 26).
Wedding Groups (Oct. 3).
Combination Printing (Oct. 10).
Flashlight Work (Oct. 17).
Flashlight Portraiture (Oct. 24).
The Question of Outfit (Oct. 31).
Telephoto Lenses for Professional Work (Nov. 7).
Changing Quarters (Nov. 14).
Carbon Printing (Nov. 21).

CARBON PRINTING.

II.

To work in comfort, it is very necessary to be provided with an efficient squeegeeing outfit, consisting of a flat squeegee, a stout glass, or zinc, plate, and a piece of thin rubber sheeting. The squeegee may be from 10 to 15 ins. in length, according to the size of the work, as it is necessary for the squeegee to be at least as wide as the print. The rubber strip should be soft and velvety so that contact can be secured without undue pressure. Roller squeegees are not suitable for carbon printing. The "mounting board," on which the tissue is attached to the temporary support and the developed print to the transfer paper, may be a slab of plate-glass, marble or slate, or a stout plate of zinc supported upon wood. It should be

absolutely flat and non-absorbent of chemicals. The rubber cloth should be about the size of the glass plate and should be soft and free from creases. Some printers use a piece of stout, single transfer paper instead of a cloth. This answers perfectly, but is wasteful, as one piece does not serve for many prints. Eighteen inches square is a useful size for the mounting board and cloth. The squeegeeing apparatus should all be well rinsed in clean water after use. This avoids crystals forming upon the surfaces, which might cause trouble. The blotting-paper should be thick and tough so that it can be used repeatedly. Ordinary blotting is not sufficiently absorbent, and it is too soft when wet to be pleasant to use.

If possible, a square galvanised tank about 4 ins. deep should be used for development. Failing this, an ordinary oval galvanised bath may be used. Shallow dishes allow the water to cool too quickly. A small gas-ring underneath the tank will keep the water to any desired temperature and save much time, as it is not necessary to renew the water often. Even when quite dark it does not affect the prints, and different colours of tissue may be developed together without altering the tints. If the water froths too much after developing a number of prints a bit of yellow soap moved about in it for a few seconds will clear it. A few small leaden weights are useful to keep the exposed tissue below the surface before stripping, but they may only be placed upon the margins of the support and not upon the tissue.

Besides the flexible support, opal glass or grained zinc plates may be used to develop the tissue upon. These must be waxed in the usual way. With new opal there is a tendency to stick, unless the first waxing is very thorough. It is a good plan to wax them and allow them to stand for a week or so before use, then to re-wax them in the ordinary way. Spoiled prints may be scrubbed off opal with a nailbrush if the surface appears clean; they may be waxed and used without other cleaning, but if there is a persistent tint or trace of the image, they must be well rubbed with Monkey brand soap, Pansbine, or similar cleanser, till the surface is quite clean again. Flexible support must not be rubbed. Spoiled prints must be removed by transferring in the usual way. Any creased or damaged transfer paper should be saved for this purpose. On the whole, finely ground opal glass is the best temporary support, as it can be used until it is broken, and it improves with use. The developed prints can be set up in racks to dry, and the prints come off flatter than from the flexible supports.

When the print has to be transferred to a rigid permanent support, such as ivory, wood, porcelain, or glass, flexible support must be used, as it would be obviously impossible to squeegee two rigid surfaces together with any hope of separating them again. With such materials a transferring solution, made as follows, must be used: One ounce of Nelson's No. 1 gelatine is soaked for four hours in a pint of water and then dissolved by standing the jar in hot water. To this is added in small quantities at a time twenty grains of chrome alum dissolved in two ounces of hot water, stirring well the while. The surface of the support is coated with this, and when set, *but not dry*, the print on its flexible support is squeegeed into contact and allowed to dry. A variation of this is to flood the surface with the gelatine solution and squeegee down at once. Of course, in either case the print must be soaked in tepid water until quite limp. The same solution may be used to coat plain glass upon which transparencies for the lantern or for enlarging are to be developed, but in this case the substratum must be allowed to dry upon the glass before using. The chrome gelatine solution will not keep, as it becomes insoluble on setting, so that no more should be prepared than can be used at once.

Single transfer printing differs only from double, inasmuch as the print is transferred directly to the permanent support, which is usually paper coated with insoluble gelatine. The manipulation is exactly the same as for flexible support, with the exception that the print is alumed immediately after development. The only drawback to this method is that reversed negatives must be used for all subjects which would betray a lateral inversion of the image. In the case of enlargements and copies of pictures taken with a view to carbon printing, this is easily done. For large work where rough-surfaced papers are required, the single transfer is invariably used, as the original surface texture of the paper is preserved, and not flattened out, by contact with a waxed support. Single transfers are usually employed for opal pictures, and in this case no substratum or preparation of the surface is necessary, the ground surface giving sufficient "tooth."

Daylight is usually employed for the production of carbon prints, and it is generally agreed that the best results are so obtained; the electric arc is sometimes used, but unless the tissue is specially sensitised to obtain the maximum of contrast, the prints are apt to be rather flat. I have found the most satisfactory substitute for daylight in the mercury vapour tube, which gives results indistinguishable from daylight. The uniformity of this light is a great advantage, as prints may be made by timing instead of using an actinometer, very even depth being obtainable throughout an order, provided that the sensitiveness of the tissue does not vary. Of the arc lamps, the Northlight printing lamp is, to my mind, superior to the enclosed arc.

Although I have only described one method of drying tissue after sensitising, there are others which are better suited for working on a larger scale. If a large, well-ventilated darkroom be available, the tissue, after having the surplus bichromate solution lightly squeegeed off, may be hung up in the open and allowed to dry spontaneously. Climatic conditions greatly affect the rate of drying, and, as a rule, if the tissue be not thoroughly dry in eight hours, it will become insoluble and useless. Four hours is a good average time for drying, and the temperature should be regulated so that this time is not greatly exceeded. Gas or coke fumes are also likely to cause a partial insolubility known as "tint." This appears in the form of a general fog all over the exposed tissue, including the "safe-edge." In my opinion, the safest and best way to dry tissue is to use a tightly closed metal-lined box or cupboard fitted with racks to carry a number of laths upon which the wet tissue is pinned; below these are one or more large dishes filled with commercial chloride of calcium, say 7 to 14 lb. in each dish. This absorbs the water rapidly, and the tissue dries quickly and evenly and free from all outside influences. If not required at once, the tissue may be safely left in the chamber. My practice was to take it down off the laths, roll it up, and put it into a large calcium tube similar to those used for strong platinum paper. Before use, the tissue should be exposed to an ordinary atmosphere until limp enough to cut without cracking, as cracked tissue is useless. I prefer to cut all tissue into sizes with a card-cutter, as, if torn, as is commonly the practice, there is great danger of little chips of the pigmented gelatine getting between the tissue and the support when mounting, causing spots which are difficult to remove from the finished print. A very quick and easy way of sensitising tissue is to use a spirit sensitiser. This is brushed on to the insensitive tissue with a flannelette "Blanchard brush." The tissue dries in a few minutes, and may be used at once. The solution, with brush and full instructions, may be obtained from the Autotype Company. I have not obtained results by this method quite equal to those got by the ordinary way of sensitising, but it is convenient when a small quantity of tissue is wanted in a hurry.

PRACTICUS.

SPOTTING PRINTS.

[Although the spotting out of pinhole markings from prints is perhaps the form of "retouching" which is most commonly needed among both amateur and professional photographers, it is perhaps that which those of both classes find a difficulty in doing, or getting done, satisfactorily. Hence the series of very practical hints contained in the following article from our contemporary "American Photography" will find an interested circle of readers among amateur workers as well as in the ranks of photographic assistants.—Eds., "B.J."]

At my work as a commercial artist I handle many photographs. In a year's time I fix up, paste up, and patch up several hundred, if not several thousand. They come in all sizes and colours, from both professional and amateur photographers; they come from the police department, the farmer, and the business man Some of them are in one piece and some look like a crazy quilt, while many are excellent prints from a technical standpoint. These prints, or those that need to be, are "doctored" so they are suitable for the half-tone process; they are worked up according to their needs or according to the customer's wishes, all the way from taking out a few spots to covering the whole photograph. Out of all these prints there are very few but need some spotting at least. The reason why there are so few prints that do not need spotting or retouching is hard to figure out. I have come to the conclusion that photographers are either careless or lack the necessary knowledge to do the spotting; therefore this article on such an apparently simple subject.

I am going to give the artist's method of retouching and spotting, which differs somewhat from the photographer's in being a little more elaborate as to colours, but at the same time more practical. I am not going into detail on retouching, using the air brush, masks, etc., but am going to explain the artist's method of everyday spotting, using only the small brush and colours.

Any print may be spotted; the matt-finished paper probably takes the colour a little better than the glossy, but the finish is of no material difference, and one should hardly use a grade of paper simply because it is easy to spot, for in the first place there should be no spots. There is a method, however, of preparing a photograph so it will take the colour better, by rubbing the surface with a suitable solution—ox gall, saliva, and gelatine being some of them. I prefer the gelatine. It is bought in thin sheets and melted in a double boiler with as little water as possible. It is then poured into a mould; the lid of a small box will do; when cold it is removed, and it will dry into a hard square piece. When used, a piece of cotton is moistened with water, rubbed on the surface of the gelatine, and then on the surface of the photograph. It serves the purpose of cleaning the print and at the same time leaves a little gelatine, but not enough to make it sticky. Any photograph can be treated in this way, but if it happens to be a platinum print, too much rubbing will mar it. Ordinary gaslight paper can be rubbed very hard without injury.

The tools used are few in number, being one or two good red sable brushes and the colour. The red sable brush is the only

Fig. 1.—Showing red sable brush. Actual size of point with holder partly cut of.

one suitable for this work; it points up well, and the hair is stiff enough to spring back into shape when released from the pressure on the paper. (See fig. 1.)

The colour plays the most important part in successful spotting. The formula given here is for quite a batch; it can be easily cut down to any desired quantity. These are regular water-colours and can be secured at any art store. They come in the regular size tubes, and are not what are called "retouch colours," which will be mentioned in a later paragraph.

The following colours are needed to make up the stock colour:—

Sepia	4 tubes.
Vandyke brown	3 tubes.
Sap green	2 tubes.
Lamp-black	2 tubes.

The colours are all squeezed out upon a piece of glass or a mixing slab, then thoroughly ground together with a palette knife; a case-knife will do. After being thoroughly mixed, it may be placed in a jar or other receptacle until we are ready to mix the graduated colours. Before mixing our colours it will be well to consider the two kinds of colours with regard to their covering quality or density. They have been named opaque and transparent colours. While any colour is opaque if put on thick enough, it is not necessarily an opaque colour. With the addition of white to the colour it becomes opaque. The advantage of working with opaque colours is that they can be worked one over the other, the light over the dark colour or the dark over the lighter shades. A white spot on a print can be very easily built up with a transparent colour, but if the spot happens to be black it will need a light opaque colour to cover it. With the transparent colours, the white paper showing through the colour makes the lighter shades in proportion to the thickness of the colour on the paper. With opaque colours the shade depends on the proportion of white mixed with the colour.

The method of mixing colours is as follows:—Fig. 2 represents the colour slab that is used most; although it is not absolutely necessary to have one, they are much handier than

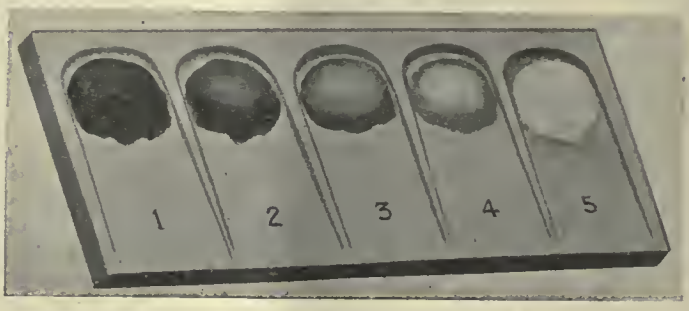


Fig. 2.—Showing the five-section slab in which the various tints needed for spotting are mixed.

saucers or a sheet of glass. The graduated colours range from the stock colour No. 1 to the lightest colour No. 5, which is nearly white. The white is obtained in tubes or small jars. There will be more white used than any other colour, so it is best to buy it in small jars. Any good grade water-colour white will do. A jar of the white is put on the mixing slab and just a touch of stock colour is mixed in with it, which will give a very light grey. About one-fifth of this is put on the slab for the No. 5 colour. You are now ready to mix the No. 4 colour. A little more of the stock colour is mixed with the remaining colour on the slab and we have colour No. 4, and so on, each time adding a little stock colour, until we get to colour No. 1, which is nearly all stock colour. The idea is to get the colours evenly graduated from the lightest down to the darkest.

Another way which might be easier to graduate them evenly: Mix No. 1 and No. 5 first, then No. 3 half-way between these two, and then the two remaining colours. Besides the five graduated colours on the slab, we sometimes need pure black and pure white, which are generally kept separate in small jars. The best pure black is what is known as "retouch brown." It is brown only when thinned out with water, and it will cover the blackest kind of glossy print. It is used only to touch out white spots on the darkest shadows on glossy prints; on any other prints the darkest colour on the slab will be dark enough. Retouch brown dries with a gloss; the other colours dry with a dead finish.

The manner of applying the colour to the print is something that comes through practice, and is rather hard to explain. The brush is dipped in the colour the full length of the hair and then wiped partly dry and rubbed on the colour. The whole brush should be thoroughly moist with colour or it will not point up properly. A blotter or rag should be handy to wipe off part of the colour if the brush will not come to a fine point. After a little practice it is easy to judge how much colour and how much water to combine to get the proper point.

Probably the part that requires the most skill is matching the different tones on the photograph with the retouch colour. Here is where the graduated colours are a great help. With white and black and the five colours on the slab, it will be much easier to find the right shade than when using only one or two colours. These colours are mixed for the average warm black-and-white gaslight print. If the print is of sepia tone a little more Vandyke brown added to the colour while mixing with the brush will help to get the proper shade. The way to apply the colour to the spots without its being noticeable depends on the size of the spot. A small spot will need only one touch of the brush to eliminate it, but the larger ones are not quite so easy to get rid of. To cover the larger ones and place the colour smoothly is best accomplished by stippling. This simply means to fill in the space by the use of small dots until it is a solid mass to the naked eye, but if put under a magnifying glass it would appear something as shown in fig. 3. This represents the filling in of a light spot with a darker colour. Fig. 4 represents the filling in of a dark spot with a lighter colour. If the colour does not match on the

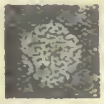


Fig. 3.—Magnified image of light spot filled with dark colour.

Fig. 4.—Magnified image of dark spot filled with light colour.

first application, it can be removed with a little moist cotton on the end of a brush handle. If only a small part of the colour is off, it is not necessary to remove the whole of it, but it may be touched up with a lighter or darker colour, whichever it needs. This is another advantage of working with opaque colours; the dark colour can always be covered with the light, or vice versa. Too much colour should not be applied; the thinner the coat the smoother the surface. If it cannot be matched with one or two applications it is best to clean it off and go over it again. A spot much larger than one-sixteenth of an inch can hardly be handled successfully with a hand brush; an air brush is needed.

After all is written about spots and spotting, it is much easier and simpler to say: to avoid spots, clean the negative thoroughly and keep it free from dust and lint, and you have the best preventive for spots, one which is better and quicker than all the water-colour remedies ever patented.

S. H. Avery.

AN ELEMENTARY SURVEY OF THE PRESENT POSITION OF AERIAL PHOTOGRAMMETRY.

1. *Definition.*

Aerial photogrammetry may be defined as the science of applying aerial photography to the making of maps.

2. *Employment of Photogrammetry Outside Aviation.*

Typical examples of the employment of photogrammetry outside aviation are:—

(*a*) Photographic survey largely used in Canada and elsewhere.
(*b*) The Bertillon method of photographically recording scenes of crime.

3. *Employment of Photogrammetry in Conjunction with Aviation.*

There is little doubt that ultimately photogrammetry will be largely used as a cheap, rapid and accurate instrument for making maps, showing distances, contours, and minute topographical detail.

Aerial photogrammetry has grown up almost entirely during the war and its problems have been partially solved as they arose. Like every method of survey it has its limitations, and although it would be absurd to imagine it entirely supplanting more usual methods, there is no doubt that it can almost always be of tremendous assistance.

For every individual tract of country to be surveyed, before deciding to use aerial photogrammetry, it will be necessary to determine among other things:—

(*a*) How much of the work is already done, and whether the data is sufficient for the aerial photogrammetrist to complete the work.
(*b*) Whether the country is better suited physically to ground survey than to aerial survey.
(*c*) The relative cost of the two methods.

4. *Some Features of the Ideal Camera for Aerial Photogrammetry.*

In the ideal apparatus provision should be made for recording accurately and automatically upon every photograph—

(*a*) The compass bearing.
(*b*) The altitude of the instrument above a known datum plane.
(*c*) The hour.
(*d*) The direction and degree of tilt of the optical axis as regards the vertical.
(*e*) The optical centre of the photograph (*i.e.*, the intersection of the principal optical axis and the sensitive surface).

It is essential that the principal focal length be accurately known, and that the sensitive surface be strictly flat and perpendicular to the principal optical axis.

It is further very desirable that some simple stabilising device (gyroscopic perhaps) be incorporated, so that, with a view to minimising correctional work, the optical axis will remain as far as possible in the direction desired.

The lens should preferably be a highly corrected type of wide aperture. The selection of its focal length will depend upon the particular type of work in hand.

The sensitive surface should preferably be panchromatic and of high speed, coupled with very fine grain. The base of the sensitive surface may be either rigid or flexible. The relative advantages and disadvantages of celluloid film are summarised below.

Advantages.	Disadvantages.
Adaptability to automatic drive.	Difficulty of securing flatness.
Lightness.	Awkwardness in subsequent handling.
Small bulk.	Difficulty in keeping good panchromatism and high speed.

It is very desirable that the changing of plates or films should alter the position of the centre of gravity of the camera as little as possible. Many semi-automatic plate-changing cameras do not possess this feature.

The focal-plane shutter is usually regarded as superior to other types for aerial work. Among its many advantages may be mentioned the fact that a "kick" of quick period vibration occurring during exposure will result only in a band of "movement" appearing on the photograph, whereas other types would show movement all over the photograph.

The changing of the sensitive material should preferably be automatic, either wind-driven or motor-driven.

The exposure is perhaps preferably made by the operator, but the automatic succession of exposures is often advocated.

The moving parts and plates should be so housed that swing and tilt of the camera will not cause displacement. Gravity-fed cameras almost invariably suffer occasional jambs through violent turning movements of the aircraft.

The selection of size and shape of the plate or film employed will depend upon the type of work in hand, the focal length used, and the altitude from which it is proposed to work. Weight and bulk also will, of course, need consideration.

5. *Photographic Technique.*

Commercial lenses, plates, paper and chemicals, and light filters offer so wide a range of usefulness that in aerial photography no very marked departure from everyday practice is necessary.

6. *Compass, Altimeter, and Clock.*

Any forms of these instruments that are compact and accurate are suitable, and they should preferably be mounted in an accessible position so that they can readily be adjusted. There is no great difficulty in mounting them so that their readings are automatically recorded upon the photograph.

The compass and altimeter should not possess any undue lag in recording changes.

7. *Inclinometers.*

In the absence of proved apparatus for maintaining the principal optical axis truly vertical some form of inclinometer is desirable. Centrifugal force may at any time cause this instrument's readings to be inaccurate, but its errors will not necessarily be persistent. While aircraft is actually engaged upon photography flying must be as straight and free from "stunts" as possible, and in such circumstances inclinometer readings may probably be very nearly accurate. There exist many neat types of instruments (gravity worked) which can be mounted inside the camera, and which will give readings of the degree and direction of inclination.

8. *The Carrying Aircraft.*

(*a*) High-powered small aeroplanes present great handicaps by reason of vibration and necessary limiting of weight, dimensions and working space of the apparatus. Further, their rapid turns, climb and descent are liable to cause displacement of the photographic apparatus.

(*b*) Medium and large size aeroplanes remove the handicaps of weight and space limitation, and in them a bay largely free from engine vibration is usually available for the apparatus. In flying they are steady and probably are the best type for war-time photogrammetry.

(*c*) Absence of vibration and small centrifugal stresses from pitch, roll and yaw are qualities which might render the small *lighter-than-air* craft suitable for peace-time, and particularly oblique, work

9. *The Camera Mounting.*

Attention must be paid to:—

(*a*) Security.

(*b*) Absence of vibration and wind pressure

(*c*) Cleanliness.

(*d*) Accessibility.

Until the difficulties besetting gyroscopic and other stabilisers are completely overcome it is probably good policy to mount the camera so that it is either rigid with the aircraft or limited to a small range of movement in relation to the aircraft. For the cure of vibration troubles both methods have their advocates, and both have been successfully employed. Mountings on some form of cushion principle (either spring, rubber or pneumatic) are probably the most generally satisfactory.

10. *Stabilisers.*

In warfare the loop, vertical bank, vertical dive, spin, roll, etc., are common evolutions. Any stabilising device designed to maintain the optical axis vertical during such evolutions must necessarily be on the "gimbal" or some similar principle (it is obvious, for example, that a ball and socket support or suspension will not suffice), and the gimbal would need to be of such a size that the camera had space for a complete "somersault" in every direction. It would be necessary also that the camera controls (drive. release, etc.) had provision for complete revolution in every direction.

Even with a gimbal fitting possessing these features it is very certain that gravity alone would not exert sufficient force to overcome the centrifugal force of, say, a loop. In addition to the centrifugal stresses set up in aeroplanes by pitch, roll or yaw (which stresses are, of course, much more violent in aircraft than in watercraft) it is necessary to overcome a swinging pendulum motion that may be at times set up by variable pull or thrust of the air screw, and it is probable that "bumps" also would exert some peculiar stress. The solution that immediately suggests itself is the gyroscope. But it is very doubtful whether any gyroscopic device yet designed would overcome all the complicated stresses that may be involved. And it should be remembered that a shock of stress to a gyroscopic stabiliser will under certain conditions result in a persistent alteration of the datum plane in which it is desired to maintain the optical axis.

Any stabiliser that does not completely overcome any and all of the stresses to which the camera *may* in practice be subject would be a source of danger if relied upon in photogrammetric work. Even in peace flying some incident in taking off or climbing might upset the datum plane of the instrument, and out of a false sense of security large errors in mapping might ensue.

The best working method at present is one in which the camera's optical axis is normally perpendicular to the flying-level line of the aeroplane, and in which provision is made for the damping of vibration and for the free swinging of the camera through about 10 deg. in every direction from the vertical. Under such a system of mounting the careful co-operation of the pilot in keeping the aeroplane on a level keel will usually limit the unwanted angle of tilt to, say, 4 deg. from the truly vertical. The use of *mean* photogrammetrically determined positions for terrestrial points will prevent the occurrence of any undue cumulative errors.

11. *The Position of the Principal Optical Axis.*

The principal optical axis in the ground photo. survey in Canada, and in the Bertillon method mentioned above, is maintained in a horizontal or nearly horizontal plane. In aerial photogrammetry such a position is unsuitable because of the necessity for using an extremely wide-angle lens, and because even the foreground of the photograph would be very distant. In aerial photogrammetry, however, when the axis is truly vertical, map-making is extremely simple so long as the photographed territory contains two known points and a sufficient number of other points suitable for addition to the map. Difficulty is experienced under this last head in desert regions. Where the optical axis is not vertical there is, of course, no reason why any side of the rectangular plate should be parallel with the ground; but where the amount and direction of tilt of the optical axis is known the correction of the photograph for mapping presents no great difficulty, and several workers have evolved systems and apparatus for the purpose. Where the amount and direction of tilt of the optical axis is not accurately known, so long as the photograph contains a sufficient number, say four, of known points, the amount and direction of tilt can be determined, and the distortion can be corrected.

In order to save a large amount of work, however, it is highly important that the following factors should be known with the greatest possible accuracy:—

(*a*) Altitude of the camera above some known point included in the photograph (*i.e.*, above some known datum plane).

(*b*) The focal length of the lens.

(*c*) The direction and amount of tilt of the optical axis.

12. *Multiple Lenses.*

Various forms of aircraft camera have been designed carrying more than one objective. The object in some has been to include in photographs taken simultaneously the horizon in two different compass directions (opposed at, say, 90 deg.), so that from the position of the horizon upon the photographs the tilt of the optical axis would be immediately determined. The difficulty here is that when working from any great height, and on days at all misty, the horizon line cannot be fixed upon aerial photographs with any approach to accuracy. The object in other cases was to photograph as much territory as possible simultaneously (partly obliquely and partly vertically), so that from the position of the images of many known points could be deduced the position of the other points. One such camera is the Panorama-Apparat of Scheimpflug, which, however, is cumbersome, and its utility has not been fully established.

As an alternative it has been suggested that a ground camera and an aerial camera should photograph each other's positions simultaneously, so that from the position of the image of the aircraft upon a vertical plate exposed on the ground, and the position of the image of the ground camera upon the oblique plate exposed in the air, triangles would be available from which all the data as regards tilt, etc., could be deduced. There are many objections to this scheme, the chief of which is perhaps that the ground camera would need to be so far forward, and would need to make so many changes of station, that in place of the aircraft a ground photo-theodolite or the plane-table might be used with more ease and almost equal effect.

13. *Ground Contour.*

Oblique aerial photographs studied comparatively yield useful data as to contour. Assume that two photographs are taken obliquely from different view-points, but each including common territory. When a *sufficient* number of image-points from each have been made to coincide when plotted upon the map, assume that there is some point included in each photograph the images of which will not coincide when plotted upon the map. It is obvious that the altitude of that point is different from the altitude of the other points, and it is clear that if we plot both images upon the map and join each position to the point immediately beneath the camera at the moment of exposure, the intersection of the two lines will be the true position of the point upon the map. It is also clear that the altitude of the point can be calculated from the amount of displacement that occurred.

Some years ago the Zeiss Stereo-Micrometer and the Zeiss-Pulfrich Stereo-Komparator were introduced for the study of contour. These instruments can be used for the measurement of differences in level made visible when paired aerial photographs are viewed in the stereoscope. After sufficient tests, much is hoped from the practical employment in aerial photogrammetric work of a simplified form of the latter instrument.

14. *Conclusion.*

Many thoughtless people have the impression that for map-making a few hundred aerial photographs are all that is required.

Many surveyors, on the other hand, with well-proved faith in their excellent instruments, rather disdain the aerial photograph.

Meanwhile inventors are busy improving aircraft and photogrammetric apparatus, and mathematicians are busy working out and simplifying systems of correction.

The whole subject contains a fascination, and as soon as the cheapness and accuracy of its employment have been demonstrated it is safe to prophesy a speedy recognition and appreciation of its value.

P. R. Burchall, Squadron Leader, R.A.F.

FORTHCOMING EXHIBITIONS.

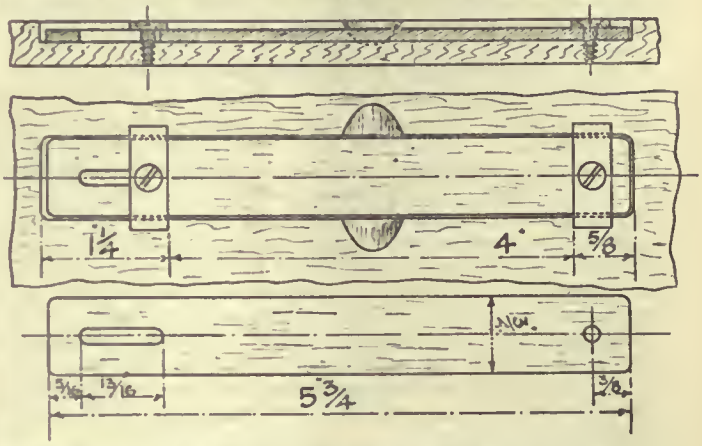
October 13 to November 29.—Royal Photographic Society.—Secretary, J. McIntosh, 35, Russell Square, W.C.1.

December 20, 1919, to January 24, 1920.—Scottish Photographic Federation. Entries close December 1. Sec.: John Macdonald, 27, Aberfeldy Street, Dennistoun, Glasgow.

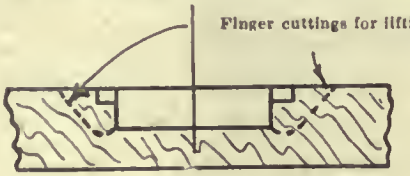
The Zeiss Firm, of Jena, according to a newspaper report, has been forced to close down its works temporarily through lack of coal.

A FLUSH HANDLE FOR CAMERAS, INSTRUMENT CASES AND LANTERN SLIDE BOXES.

Many are the instances in which the projection of handle or handle-fittings proves an inconvenience on a camera, and a distinct disadvantage on an instrument case or lantern slide box, when it may be desired to store one on top of another. The handle shown in the sketches entirely overcomes such difficulties, and, being of simple form, can be fitted by anyone of comparatively small mechanical skill. The only operation requiring such skill is the making of the



recess to receive the handle; this, however, can be readily done by the aid of a small chisel, if the outline is first cut to the required depth with a sharp-pointed knife. The actual handle can be cut from a scrap of saddlers' leather or a portion of an old strap, a leather punch or small cork borer being useful, but not essential, for making the hole and the ends of the slots. The bridges are made from strip brass ⅜ in. by 1-16 in., being secured by No. 6 wood thread screws of about ½ in. length if the thickness of wood will allow. If, however, the wood is thin, it is better to secure



Cross section showing recess in wood.

the bridges by metal thread screws and nuts, as shown in the alternative sketch. Suitable ⅛ in. screws ½ in. long, with square nuts, known as pressed nuts, cost only a few pence per dozen, and are useful in many other ways for repairing apparatus, etc.

If the camera, case, or box is thin (say, not exceeding 3-16 in. thick), the recess can be cut through and backed up inside by a piece of thin wood, sheet metal, or even cardboard, the backing being held in position by the screws and nuts which secure the bridges.

The dimensions given in the sketch are those which will be found suitable for a small and compact handle, yet large enough to take the hand of an average man (say, the wearer of a size eight glove). Should a larger handle be required, it is only necessary to increase the distance between the bridges by ¼ in. to ½ in. without altering the sliding movement. The handle shown in the sketch is as

Alternative section for thin cases.

arranged for fitting lengthwise to a box-form camera. If, however, it is required for use on a symmetrical case, the sliding movement may be arranged half at each end without altering the proportions.

Where symmetry is not required for the sake of appearances it is well worth the slight additional trouble to fit a handle so that an

equal balance is obtained, as the added comfort in carrying a magazine hand-camera so arranged is quite appreciable. It is only necessary to suspend the camera or case horizontally in a string sling and then mark the point of suspension as the centre of the handle.

VIVIAN JOBLING.

Assistants' Notes.

Notes by assistants suitable for this column will be considered and paid for on the first of the month following publication.

Hand-Cameras for the Professional.

A VARIED experience in professional photography has led me to the conclusion that the hand-camera is a much under-valued and under-used instrument, and it is the purpose of this article to point out a few of the many ways in which it may be useful, to give some hints as to the selection of an outfit, and, lastly, to give a few practical tips as to its use. I know it is the habit of many "pros.," especially middle and upper class men, to look down on the hand-camera as something below their notice. This is a pity, because there are many cases in which it is the best possible instrument, and some cases when results can only be got by its use.

The ways in which a hand-camera may be useful to the average "pro." may be classed under three main heads:—(1) The taking of topical events; (2) photographing from positions in which a stand camera is impossible; and (3) in the photographing of restless children and animals.

Many studios look with small favour on topical events—processions, opening ceremonies, football matches, etc.—and yet they are great business-makers. They are really a wonderful chance of an advertisement which will not only not cost you anything, but will bring you a handsome profit if worked on the right lines. Every studio needs this, something to remind the public of their business. Get a good negative, print it well, and do not forget to put your name plainly upon it. Let people see where it comes from, and then if they like the print they will want to know more about you.

To take our second point. In the course of a photographic lifetime one comes across quite a number of jobs which one would like to refuse, and often enough the trouble is to get the camera where it is wanted. Let us suppose that a photograph is wanted of a house from a river. The opposite bank is impossible, and it is essential to get the near bank in. What is to be done? If you get a Dreadnought moored in the river for you, you might get a decent stand-camera negative, or if you don't mind standing in four feet of water you might do it; but if you want the best result with the least trouble you get a hand-camera and use it from a punt or other small boat.

Now, to refuse such a job as this is confession of incompetence. "Why," your customer will most likely tell you, "I've taken it myself with a Brownie, only I want a big one now." No, it won't do to refuse the job; but to try it with a stand outfit will be worse still, because a bad result is worse advertisement than no result at all.

Now for our last class—or, rather, two classes—children and animals. Never try to take a restless child in the studio if an outdoor appointment can be made. The strangeness of the studio and the restraint of having to sit still destroy all chance of a natural result, unless one can spend hours over the job. By making use of a hand-camera out of doors perfectly natural studies can be obtained. The background may be blocked out on the negative or a well-chosen natural background may be left—it is quite as satisfactory as many studio productions. The lighting may be controlled to a great extent by taking advantage of building, trees, etc., and the occasional use of temporary screens and reflectors.

The use of a hand-camera in the taking of dogs, horses, cattle, etc., outdoors saves much time. Trying to photograph a restless horse with a stand outfit is one of the most trying jobs you can get; but use a hand-camera and it is easy, and again the results gain much in "naturalness."

There are three types of camera suitable for a professional—reflex, collapsible focal-plane, and hand-stand. The one to get depends on the class of work it will be chiefly used for. The reflex is by far the best for taking children and animals where close-up studies are needed. The ease with which the normal lens is changed for one of longer focus is an advantage not to be overlooked. The disadvantages of a reflex are three: bulk, the fact that it has to be used at waist level, and that, except in the finest instruments, the jar of the mirror going up prevents very slow speeds being used without camera shake being obvious on the negatives.

The collapsible focal-plane is a most useful camera for street work and for any objects at a moderate distance. It has the advantages of being light and easily got ready for work. Its disadvantages are two: it usually has very limited extension, and it is not easy to substitute a lens of different focal length. When one lens only is needed, and that for fairly distant objects, this type will be found perfectly satisfactory. The hand-stand type of camera is useful chiefly when it is desired to take only one camera, and yet be prepared for ordinary stand work and "snapshots." It is a remarkably efficient instrument, and when fitted with a focal-plane shutter is really ideal for most work. The only point against it is the fact that the use of more than one lens means the use of more than one focussing scale, a state of things which often leads to mistakes.

A question that is sure to arise at this point is, "What size?" Half-plate is generally the smallest size plate used by professionals, so that many will choose this. That has the additional advantage of making your new lens an addition of some value to your stand camera set, or it may mean you do not have to purchase a new lens at all. In spite of this, I think half-plate rather too big. Not only is the camera itself bulky to hold, but the plates are expensive, and there is bound to be a larger proportion of "wasters" with a hand outfit than with a stand one. I think 5 x 4, or even quarter-plate, will be found quite big enough for the average job, the results being enlarged whenever it is thought necessary.

Now as to hints on working. To begin with, get rid of any idea you may have about hand-camera negatives being inferior to stand ones. They *can* be first-class if only you take the same trouble over them as you do over your ordinary work. Your negatives *must* be sharp, because in most cases they will have to stand enlargement. This means a good lens, accurate focussing, and, above all, a steady camera. Find out what is the largest exposure you can give without shake, and stick to that, except when movement of your subject necessitates speeding up. You are not likely to over-expose "snaps," but you *will* under-expose unless you are careful.

You can, of course, use your ordinary developer, or you can make up a special one. I have found nothing better for under-exposed negatives than the pyro-metol formula given in the "British Journal Almanac." This certainly brings more detail out in a negative than the average pyro-soda.

When you have got your negatives, don't say, "Anything will do for those snapshots." Take the same care over the retouching, printing, and enlarging as you do in the case of studio negatives, and you will shortly find that hand-camera negatives may not only be as good, but also as profitable, as any others.—ARTHUR G. WILLIS.

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Applications, November 10 to 15.

POCKET CAMERAS.—No. 27,928. Pocket cameras. B. Wolf.

CAMERAS.—No. 28,032. Magazine cameras. D. Laing and F. White.

FILMS.—No. 28,042. Treatment of photographic films. H. V. Lawley and A. J. Williamson.

FILM HARDENING.—No. 28,287. Method of hardening photographic films. J. H. Christensen.

MOUNTS.—No. 28,120. Combined mounts and stands for photographs. British Leather Goods Co., G. F. Hinks and T. Mason.

COLOUR PHOTOGRAPHY.—No. 28,247. Means of taking and reproducing photographs and cinematograph films in natural colours. W. Finnigan and R. A. Rodgers.

CAMERAS.—No. 27,848. Cameras or camera stands. H. Ranson.

PROJECTION APPARATUS.—No. 28,117. Animated picture lantern apparatus. H. Sagar.

AUTOMATIC PHOTOGRAPHIC MACHINE.—No. 27,832. Electrical automatic photographic machine. H. H. Wolfe.

SUBMARINE PHOTOGRAPHY.—No. 28,134. Submersible vessels for-

taking submarine cinematograph film photographs. J. G. White and White's Film Co.

FILM PRINTING.—No. 28,042. Treatment of photographic films. Automatic Film Printers, Ltd.

COMPLETE SPECIFICATIONS ACCEPTED.

These specifications are obtainable, price 6d. each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

COLOUR-SENSITIVE EMULSIONS.—No. 133,769 (October 15, 1918).—According to the invention the colour-sensitised material comprises a light-sensitive emulsion containing a dye of the auramine or iminodiphenyl methane class (i.e., substitution derivatives of benzophenoneimide).

The chemical formula for the principal member of the class is $(N(CH_3)_2C_6H_4)_2=C=NH$, and it is to be understood that one or both of the two dimethylamido groups may be replaced by hydrogen or organic radicles, and that any one or more of the remaining nine hydrogen atoms in this typical compound may be replaced by another atom or group such as chlorine, the amido group, the ethyl group, and others, to form other dyes of this class.

It has before been proposed to use auramine in the emulsion of an orthochromatic plate in sufficient quantity solely for the purpose of reducing the action of blue light on the plate in the same way as tartrazine and other yellow dyes are used in making self-screened or non-filter orthochromatic plates, but auramine has no apparent colour sensitising effect when used with dyes of the cosine group, or with any other colour-sensitising dye known at the time when it was thus proposed to employ auramine.

Heretofore it has not been known that dyes of this class, of which auramine is the chief representative, had any colour-sensitising effect. This is perhaps due to the sensitising action of this dye (auramine) occurring in the blue region of the spectrum.

The inventors have found that if auramine is applied to a chloride emulsion it makes it strongly sensitive to the blue region of the spectrum, and that it also has a just perceptible sensitising effect on the ordinary fast bromide emulsions.

The dye may be used in about the ordinary proportions for colour-sensitising, which is only from one-tenth to one-fortieth of the quantities used for screening purposes. For example, if a plate is to be treated b the bathing process, it is immersed for three or four minutes in a solution of 1 gm. of auramine, or another dye of the same class, to 50,000 c.c.s. of water.

If desired, part of the water may be replaced by alcohol and a few drops of ammonia may be added per 1,000 c.c.s. of the bath, these variations being already known in connection with the immersion of photographic materials for colour-sensitising.

If the dye is added to the melted emulsion, it may be added in the proportion of .005—.025 gms. per litre of emulsion.—Frank Forster Renwick, Sunnyside, Weald Road, Brentwood, Essex, and Olaf Bloch, 44, Finsbury Square, London, E.C.2.

COLOUR-SENSITIVE EMULSIONS.—No. 133,770 (October 15, 1918).—This invention has for its object to provide material which shall have either a different or greater colour-sensitiveness than has heretofore been obtainable.

In patent No. 133,769 means are described for obtaining a plate having either a different or a greater colour-sensitiveness than those at present existing by means of using a dye of the auramine class, which is defined as the auramine of iminodiphenyl methane class, i.e., substitution derivatives of benzophenoneimide.

According to the present invention, the colour-sensitised material comprises a light-sensitive emulsion containing a dye of the auramine class, together with one or more dyes of the isocyanine class, such for example as pinacyanol, now known as "sensitol red."

The choice of the isocyanine dye or dyes added to that of the auramine class depends upon the effect required. For example, with pinacyanol, improved red and green sensitiveness is obtained and also new sensitiveness to deep red is produced which is not found with pinacyanol alone.

The proportion of the dyes used are similar to those already employed for colour-sensitising materials. For example, if a dry plate is to be sensitised by the bathing process, it may be immersed for three or four minutes in a bath composed of 100,000 c.c.s. of water, 2 gms. of the dye of the auramine class, and 2 gms. of the isocyanine dye.

If the dyes are to be mixed with the melted emulsion, then from .005 to .025 gms. of each dye is used per litre of emulsion.

In some cases it may be desired to use the dye of the auramine or iminodiphenyl methane class in sufficiently large proportions, for example, 20 gms. to the 100,000 c.c.s. bath instead of 2 gms., or .25 gms. per litre of emulsion instead of .005 to .025 gms. to operate as a screen as well as a sensitiser.

It will be understood that in the bathing process the usual variations consist in the substitution of some alcohol for some of the water, and the addition of some ammonia may be made.

According to the invention, with combinations of auramine and pinacyanol and other combinations of the same two classes, the character of the sensitiveness is changed and improved, and is not such as would be expected, but usually different from and much greater than the sum of the effects of the separate dyes Moreover, other valuable photographic qualities are introduced or improved, for example, good-keeping properties and cleanliness Further, it is found that when the dye of the auramine class is employed in conjunction with the isocyanine dyes and in sufficient quantity to act as a screen as well as a sensitiser, it still markedly improves the colour-sensitiveness conferred as well as exerting its screening effect.—Frank Forster Renwick, Sunnyside, Weald Road, Brentwood, Essex, and Olaf Bloch, 44, Finsbury Square, London E.C.2.

AUTOMATIC SHUTTER RELEASES.—No. 133,015 (September 21, 1908). The shutter release comprises a casing 1 adapted to be attached directly to the shutter-casing, and containing driving mechanism, the driving mechanism being connected to a member 8 passing through the aperture by which the casing 1 is secured to the shutter-casing, and directly operating the shutter mechanism. As shown, the casing 1 is connected to the shutter-casing by a tube 9 rotatably mounted in a socket on the casing 1, and the member 8 consists of a wire. The tube 9 may be rigid or flexible,

Fig. 2.

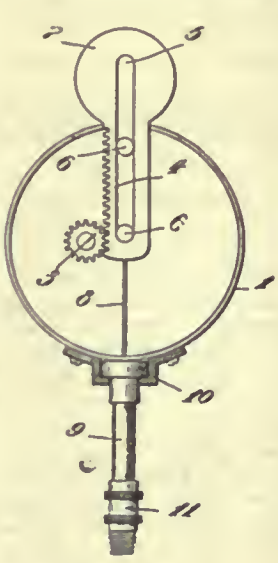


Fig. 1.

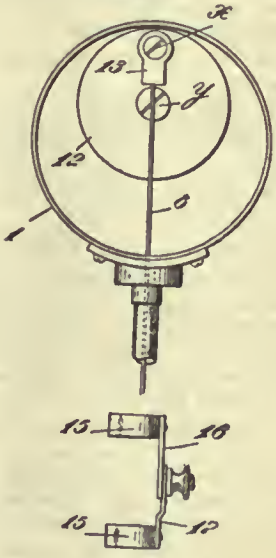


Fig. 5.

and may be immovably attached to the casing 1. The driving mechanism, after being wound up, may rotate a pinion 3 to actuate a rack bar 4 bearing a single disc 7, as shown in Fig. 1, or may rotate a disc 12, to which is pivoted at x a holder 13 secured to the wire 8, as shown in Fig. 2. If the tube 9 is flexible, a support, comprising a bar having clips at each end, or compris-

ing two relatively adjustable members 16, 17, Fig. 5, having clips 15, may be provided to hold it in position.—David Friedmann, 16, St. Annagasse, Zurich, Switzerland.

SUB-MARINE PHOTOGRAPHIC EFFECTS.—No. 134,046 (October 29, 1918). The invention consists in providing a tank for the production of photographic under-sea effects, the tank having a solid back wall, side walls provided with windows, and a front wall provided with a single window disposed between the top, bottom, and side edges thereof.—Frank Douglas Williams, 715, West 169th Street, New York.

ROLL-FILM.—No. 134,013 (October 21, 1918). The sensitive film is transversely cemented to the band at intervals, the film having at each side of and close to the line of cement an indication of where the film may be cut, as with scissors. The indications may consist of lines lightly printed upon the film. The length of each portion of band from one cemented point to the next exceeds the length of film between the same two points, so that when any section of the film is in position for exposure the portion of band that is behind the section will be slack, the pull of the band being transmitted to the film through the cemented points, so as to hold the section taut and flat.

The film and its opaque carrying-band are wound as usual on the carrying roll for marketing, and the end of the band has a terminal for connection with the usual winding-up roll of the camera. The end of the film nearest the terminal of the band may be secured to the band in the usual manner, as by a cemented transverse strip.

All of the sections can be successively exposed and then developed in the customary manner without separation of any sections, as the film is continuous. If, however, it is desired to develop the first one or more of the sections without waiting until all sections have been exposed, the user can, in the dark-room, detach the one or more sections that have been exposed by cutting on the lines. As the carrying band remains intact, and as the unexposed sections are attached thereto, the whole can be returned to the camera with the band terminal re-connected to the winding-up roll.—Irvin Maurice Kelley, 48, Baldwin Street, Laconia, New Hampshire, United States.

Trade Names and Marks.

REGISTRATIONS RENEWED.

EAGLE (DESIGN).—No. 278,595. By C. Zimmermann, trading as Charles Zimmermann and Co., in 1906. (Class 1.)

AUTOKON.—No. 278,102. By John J. Griffin and Sons, Ltd., in 1905. (Class 8.)

GOLDONA.—No. 278,134. By John J. Griffin and Sons, Ltd., in 1905. (Class 39.)

SKIPPLETTE.—No. 276,116. By T. S. Bruce in 1905. (Class 39.)

IMPERIAL (LION LABEL DEVICE).—No. 158,934. By the Imperial Dry Plate Co. in 1891. (Class 1.)

TRADE MARKS REMOVED FROM REGISTER.

In the official language of the "Trade Marks Journal" the following trade marks have been "removed from the register through non-payment of renewal fees." Such non-payment is of course the method adopted by a firm having no further occasion for the use of a mark.

CELVEREX.—No. 275,854. Registered by R. and J. Beck, Ltd., in 1905. (Class 8.)

PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.—Members of the P.P.A. may be reminded that between now and the second Friday in January next, namely, January 9, they may exercise their rights in the way of nominating members for the position of President and members of Council. A member may nominate one person as President and not more than twenty-four persons as members of Council. Under the rules of the Professional Photographers' Association any member nominated to an office is notified of the fact by the secretary, and if no reply is received within four days the member is assumed to have signified his consent. Election is by ballot, the ballot papers being collected at the annual general meeting. Nominations should be sent to the honorary secretary, Mr. S. H. Fry, 5, Highbury Grove, London, N.5.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

MONDAY, DECEMBER 1.

South London Photographic Society. "Photography and the Pantry; or, How a Photographer Got Even with His Wife." H. Creighton Beckett.
Dewsbury Photographic Society. "Self-Toning Papers." N. Ruddlesden.
Willesden Photographic Society. "Table-Top Photography." E. W. Brookes.
Bradford Photographic Society. Members' Lantern Slide Night.
Kidderminster and District Photographic Society. "Trimming." H. W. West.

TUESDAY, DECEMBER 2.

Royal Photographic Society. "Demonstration of Lantern Slide-making." A. H. Lisett.
Hackney Photographic Society. "Work on Negatives and Prints." W. Selfe.
Doncaster Camera Club. Lantern Lecture: "In Cromwell's Land—Huntingdonshire." F. Thorne.
Chelsea Photographic Society. "Foothills of the Eastern Alps." D. Johnson.
Dennistoun Amateur Photographic Association. Whist Drive.
Sheffield Photographic Society. "An Evening Walk." A. Keighley.
Manchester Amateur Photographic Society. "Demonstration on Gaslight Papers." J. E. Hedfield.
South Glasgow Camera Club. Lantern Lecture.

WEDNESDAY, DECEMBER 3.

Croydon Camera Club. "Camera Records from the Zoological Gardens." D. Seth-Smith, F.Z.S.
North Middlesex Photographic Society. "Enlarging." H. Stanton. Night Outing Print Competition.
Edinburgh Photographic Society. "Some Autochrome Pictures." W. E. Redding.
Dennistoun Amateur Photographic Association. "Pleasant Hours with a V.P.K." G. Clare. Print Criticism.
Partick Camera Club. "Camping and Tramping in the Highlands." T. Lochhead. G. and D.P.U. Visit.
South Suburban Photographic Society. "Make Your Own Printing Paper." I. Nixon.
Halifax Scientific Society. "The Amateur Photographer" and "Photography" Prize Slides.

THURSDAY, DECEMBER 4.

Hammersmith (Hampshire House) Photographic Society. "Experiences of a War Photographer." H. C. Beckett.
The Camera Club. "1,500 Miles through Great Russia, Little Russia, and the Caucasus." W. Barnes Stevani, M.J.I.
Richmond Camera Club. "A Demonstration of the Ozobrome Process." T. Manly.
Brighouse Photographic and Naturalist Society. "The Yorkshire Coast from Flamborough to Runswick Bay." H. P. Kendall.
Aston Photographic Society. "Pictorial Composition." F. W. Pilditch.
Wimbledon Camera Club. Lecture with slides: Ilford Panchromatic Plates.
Hull Photographic Society. "Lantern Slide Making." J. W. Atkinson.
Dundee and East of Scotland Photographic Association. "The Fascination of Florence." Rev. J. R. Forgan.
Rodley and District Photographic Society. "Bromide Enlarging." Messrs. E. and J. G. Farrar.

FRIDAY, DECEMBER 5.

Dennistoun Amateur Photographic Association. "Intensification and Reduction." A. Robertson.

PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

A MEETING of the Council was held at 35, Russell Square, on Friday, November 14, 1919. Present: A. Basil, Gordon Chase, A. Corbett, C. F. Dickinson, Alfred Ellis, S. H. Fry, W. E. Gray, Reginald Haines, R. N. Speaight, Lang Sims, F. G. Wakefield (London members), Marcus Adams (Reading), Frank Brown (Leicester), W. B. Chaplin (Windsor), T. Chidley (Chester), W. Illingworth (Northampton), F. Read (Southport). Letters of regret for non-attendance were read from Montague Cooper (Taunton) and H. C. Spink (Brighton).

The minutes of the meetings held on October 10 and 23 were read and confirmed.

The Finance Committee recommended the payment of accounts amounting to £16 odd, and these payments were authorised by the Council.

At the instance of Mr. Illingworth the advantages of incorporation were again discussed. Mr. Illingworth read and complained of a paragraph in the circular (page 300) on the subject; he suggested that the paragraph had been written by some of the members of the Council in collusion to oppose his action. Mr. Fry stated that he had written the paragraph without assistance, and that read in the ordinary and natural meaning of the words it represented the present position of the matter, and was favourable to Mr. Illingworth's suggestion of incorporation at some future time. He himself was in favour of some form of incorporation, but thought the time not quite ripe for action.

Mr. Illingworth pressed for a decision in the matter. Mr. Frank Brown discussed the matter, and quoted a legal opinion he had

obtained. After referring to associations of some important professional bodies, which were acting under Parliamentary powers or Royal Charters, he said that the Professional Photographers' Association existed for the benefit of master photographers, and one could hardly make comparisons between it and the associations to which he had referred. The great point was to maintain the usefulness of the Association for the benefit of men who were making their livings at the business

Mr. St. George doubted if the matter of incorporation were really urgent, but Mr. Illingworth was sure it was urgent.

Mr. Haines believed that most of the members of the Council were in favour of incorporation, and stated that he was pretty sure they should find that they would have to incorporate, but stated that he was dead against incorporation at the moment. In this remark he was supported by Mr. Read.

Thereupon Mr. Illingworth accepted the suggestion that the matter be deferred, but not dropped.

The proof copies of the new edition of the handbook, with additional matter—the whole written and revised by Mr. Mackie—were then discussed in detail, and subsequently passed for printing. A letter of appreciation to Mr. Mackie for his work was ordered to be sent to him by the Hon. Secretary.

Mr. Illingworth moved, and Mr. Chaplin seconded, a motion that a special general meeting of the Association be held on December 12 at 6 p.m., at 35, Russell Square, for the purpose of so altering the rules as to empower the Council to engage a paid secretary; and the Hon. Secretary was instructed to send out the proper formal notices to the members.

Congress.—A Committee, consisting of Messrs. Speaight, Basil, Marcus Adams, Lang Sims, and the officers of the Association, was appointed to make the necessary arrangements.

Objectionable photographs.—The Council had before them a letter from a member thanking a member of the Council for drawing his attention to photographs of bathers at a South Coast watering place, and stating that the local municipal authorities were dealing with the matter to prevent a repetition of the vulgarity.

The next meeting of the Council will be held on Friday, December 12, immediately after the conclusion of the special general meeting.

ROYAL PHOTOGRAPHIC SOCIETY.

Meeting held Tuesday, November 25, Mr. C. H. Oakden in the chair.

In the course of a lecture on "No" and other things Japanese, Mr C. P. Crowther gave a most interesting description of the character and origin of the performances known as "No," and consisting partly of a play and partly of a highly perfected form of very slow dancing, which are attended with the very greatest interest by the more cultured of Japanese. As a performance the "No" dates from some hundreds of years back, and its traditions have been preserved with very great accuracy through the art of its acting and dancing having been handed down from father to son in many families of professional performers. The original costumes and masks used by their ancestors as remote as twenty generations were employed on the "No" stage at the present time. From what Mr. Crowther said "No" is evidently the choice of the elect. Its performance, beginning at nine o'clock in the morning and lasting throughout the day, will be watched with the same degree of interest as that with which a highly musical audience will follow grand opera. Yet some idea of the deliberation of the dancing is conveyed by the fact that in a dance lasting forty minutes a "No" performer may not make more than sixty steps. Mr. Crowther illustrated the costumes of the "No" performers by photographs of his own and by Japanese drawings

Passing to other things Japanese, he gave a short account of other folk plays less solemn in character than the "No," and frequently acted at intervals during a "No" performance to lighten the proceedings; also of the marionette plays which were very ancient performances in Japan, and were shown without any concealment of the figure and hands of the men controlling the movements of the puppets. Mr. Crowther came in the end to a brief but very interesting talk on a few of the manners and customs of Japan and on past and present conditions of living, taken from his experience of twenty-five years in the country.

A most cordial vote of thanks was accorded to him.

CROYDON CAMERA CLUB.

Dr. C. Atkin Swan re-entered a congenial, albeit not an ecclesiastical, atmosphere last week with a repetition of a lantern-lecture, embracing sunny and smelly scenes in Algeria. Mrs. Atkin Swan having expressed a strong wish to visit Croydon and inspect the "weird collection of oddities" (*vide* the "Walrus"), the rules and regulations relating to the maintenance of peace and harmony by the exclusion of the feminine sex were relaxed, and she and another fair visitor were cordially welcomed by a crowded audience. It cannot be said the doctor appeared cowed, but he certainly was on best behaviour, and despite this handicap scored heavily as usual.

He began in customary fashion by going for the "office boy," with a suggestion that this inoffensive personage should hazard a guess on every slide shown as to its panchromatic origin, or the opposite, and pay a dollar forfeit to the club funds with every "bloomer" made. The making of bloomers at a minus rate of pay was promptly declined, though on "Heads I win, tails you lose" principles the club would have stood nicely.

The only real clash of arms arose on the question of mirages, the doctor mentioning he had attempted to photograph them and failed. "The sort of mirages you observed possibly never could be photographed," enigmatically observed a member; but it transpired that many have attempted to record these curious optical phenomena without success. One operator in Turkey, it was stated, time after time had vainly endeavoured to photograph them. To add to the puzzle, in some cases at least, the mirage can be seen on the focussing screen.

The doctor's theory on the subject could only be grasped by specialists in his own line of thinking, but it was dimly gathered that mirages were possibly composed of chunks out of the ultra-violet and yellow of the spectrum reacting on each other. Its basis on an analogy of fluorescence, due to impact of X-rays on certain substances, led Mr. Jobling to endorse this view. The optical Mr. Reynolds was then asked to speak. He rose, feebly murmured something about the highly original nature of the opinions expressed, and succumbed. Mr. Ackroyd thought that the failure of the plate to record a mirage arose from the fact that the strong white light shining through it obliterated the aërial mirage, and this commonplace explanation was considered to be probably correct. If there are any readers abroad who have specialised in the mirage business it would be interesting to have their experiences. Even as a side-line, it does not appear to be a paying proposition. A most hearty vote of thanks was accorded the lecturer with much acclamation.

Commercial & Legal Intelligence.

Legal Notices.—Notice of intended dividend is given in the estate of John Page Croft, photographic paper and apparatus maker, etc., Packwood, Grove Avenue, Moseley, Worcester, and carrying on business at Cooksey Road, Small Heath, Birmingham, also at 24, Quadrant Chambers, New Street, Birmingham, and Alfred Roffey, photographic paper and apparatus maker, etc., residing and carrying on business at 586, Coventry Road, Small Heath, Birmingham, also carrying on business at 394, Cooksey Road, Small Heath, Birmingham. Proofs must be lodged on or before November 29 with A. S. Cully, Official Receiver, Ruskin Chambers, 191, Corporation Street, Birmingham.

A first and final dividend of 1s. 2¼d. in the £ has been declared in the estate of the Louvre Studios, Limited, 127, Earl's Court Road, Earl's Court, London. The dividend is payable at the office of the Official Receiver and Liquidator, 33, Carey Street, Lincoln's Inn, W.C.2.

NEW COMPANIES.

Kopoh Co., Limited.—This private company was registered on November 17, with a capital of £2,000 in £1 shares. Objects: To carry on the business of manufacturers of and dealers in photographic materials and optological goods, etc. The first directors are D. Norman, 269, Crosby Road, Seaforth; G. W. Black, 38,

Moss Grove, Liverpool; J. Oates, 269, Crosby Road, Seaforth. Solicitors: McAusland and Airey, 8, Victoria Street, Liverpool.

Dye Impression Photos, Limited.—This private company was registered on November 12, with a capital of £5,000 in £1 shares (2,500 pref.). Objects: To acquire letters patent and provisional protection patent rights and inventions relating to dye impression photography, cinematography, or photography of any kind, etc. The subscribers (each with one share) are F. W. Donisthorpe, 87, Lauderdale Mansions, Maida Vale, W., photographic expert; W. H. Edridge, 24, St. Mary Abbott's Terrace, Kensington, W., consulting engineer. The first directors are F. W. Donisthorpe and W. H. Edridge. Registered office: 24, St. Mary Abbott's Terrace, Kensington, W.

News and Notes.

Maidstone Photographic Society.—A new photographic association, affiliated to the Maidstone Church Institute, has been established under this name. The President is Mr. H. W. Witcombe and the secretary, Mr. H. E. Libby, The Gables, Loose, near Maidstone. Meetings are held every Tuesday at the Church Institute, Maidstone.

Photographs of Spitzbergen.—Messrs. Speaight, Ltd., have informed us that an exhibition of photographs of Spitzbergen, taken by Mr. Richard N. Speaight, was to be opened at Messrs. Speaight's premises, 157, New Bond Street, London, W.1., by Sir Martin Conway, M.P., on Wednesday, November 26. The photographs are shown by permission of the Northern Exploration Company, Ltd., the undertaking interested in the winning of coal and other minerals from the deposits in Spitzbergen.

Eastman Kodak War Memorials.—On November 12 and 13 last, so we read in the "Rochester Democrat," memorials were unveiled in the works of the Eastman Kodak Company to those employees who had undertaken military service, and more particularly to those who had fallen. The memorials took the form of nickel silver tablets engraved with the names of the employees in silver against a black background. Mr. George Eastman presided over the ceremonies, which took place in various sections of the works. Altogether, from the different branches of the factory and in the executive offices, there were 980 employees engaged on military service, of whom twenty-two were killed.

Death of Mr. S. D. Chalmers.—We regret to see the announcement of the death, on November 7 last, of Mr. S. D. Chalmers, head of the Department of Technical Optics at the Northampton Polytechnic Institute, Clerkenwell, and a past President of the Optical Society. An Australian by birth, Mr. Chalmers graduated at the University of Sydney, and subsequently at Cambridge, where he was thirteenth Wrangler. During the war he had been very actively engaged, not only in important scientific work for the Ministry of Munitions, but also in the organisation of workshops for the training of girls as grinders and polishers of lenses. The strain of this work, in addition to his regular duties, was no doubt a chief cause of his death at the early age of forty-two.

The 1920 Abdulla Almanac.—For the wall almanac issued by them for the forthcoming year, Messrs. Abdulla and Co., the well-known firm of cigarette-makers, have enlisted the help of a number of artists of distinction, whose work, reproduced in colour, forms a very attractive series of sheets. Among these artists are Reginald E. Higgins, R.B.A., Noel Pocock, Innis Meo (Italy), K. Miyake (Japan), and F. Sancha (Spain). It deserves to be prominently mentioned that 20,000 copies of this almanac are offered for sale for the benefit of the British Red Cross Society, which, it is hoped, will benefit to the amount of £1,000. The almanac may be obtained through any tobacconist or post free from Messrs. Abdulla, 173, New Bond Street, London, W.1, price 1s. 4d.

X-ray Work.—An exhibition of prints illustrative of the employment of the X-ray is being organised by the Röntgen Society, who have accepted an invitation of the Royal Photographic Society to provide a collection of such prints to form an exhibition at the Royal Photographic Society's House, 35, Russell Square, W.C., from January 6 to February 7, 1920.

The exhibition will be open daily (admission free) from 11 a.m. to 5 p.m., and on the evenings of January 6 and January 13 till 9 p.m. On the former date an elementary lecture on "The X-Rays Approached from the Popular Standpoint" will be given by Dr. George H. Rodman, and on January 13 a discussion will be opened by Major G. W. C. Kaye, O.B.E., M.A., D.Sc., on "Some Aspects of Radiology."

Artificial Daylight.—At a meeting of the Illuminating Engineering Society held on Tuesday evening last a demonstration was given by Mr. L. C. Martin, lecturer in the Technical Optics Department of the Imperial College of Science, of an invention for providing illumination identical with that of normal daylight. The correction of the illumination from an artificial light-source for this purpose is carried out by reflection of the rays of light from a screen consisting of small patches of various colours. Such an invention has many useful applications in the visual matching of colours. It is doubtful whether a similar source of light of power sufficient for studio portraiture would really be very greatly to the photographer's advantage. At present equally good portraiture is done by lights of such different spectral composition as open and enclosed arcs and mercury vapour, but there are no doubt aesthetic reasons for the adoption of a light identical with daylight in its visual effects.

Correspondence.

**** Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

**** We do not undertake responsibility for the opinions expressed by our correspondents.*

QUANTITY ONE-MAN TANK DEVELOPERS.

To the Editors.

Gentlemen,—I do not often take exception to anything in the "B.J.," but, having a one-man business myself, I think there must be something wrong in "Assistants' Notes," page 679, of November 2. There Mr. A. G. Willis says:—"The owner of a one-man business is busy operating all day; at perhaps about 9 p.m. he finds himself faced with the task of developing, let us say, 160 half-plates."

First, supposing he works ten hours in the studio; 160 half-plates means sixteen plates an hour, and, supposing he takes two of each sitter, means about 7½ sitters, taking eight minutes for each sitter (in the hour). To fill up the slides and do this in eight minutes for each person wants some doing. It must be cheap work, or clients would not put up with it. I have seen some of the quick-taking places, and they take about five minutes average for each. Then, if he is a one-man business, when is he going to do his printing or anything else, unless he puts it out?

Second, there is a little misunderstanding about the time developing. If he has two tanks, twenty-five plates each, he could not do them in half an hour with ordinary tank development, as they should stop in there for that time at the least, and longer (weaker development) is better—at least, I have always understood so.

My opinion about it is this: If the man has that amount of plates to take every day he could, and should, do with at least three or four assistants, and he could well afford them, unless he was taking them at cost price.—Yours truly,

Barnet, Herts. A. England.

MEASURING FOCAL LENGTH.

To the Editors.

Gentlemen,—As the various methods of obtaining the focal lengths of objectives seem to be of general interest and value, may I be allowed to state one system that I do not remember to have seen mentioned hitherto? It is this:—Take a negative of the sun, and, when developed, measure as accurately as possible the diameter of the solar image (preferably by means of the microscope). Now this quantity, whatever it may be, divided by .0093 will give the equivalent focal length of the lens employed. The system depends on the

fact that the angular measure of the sun's diameter at mean distance is 32 minutes of arc, and the constant .0093 is the sine of this angle. April and October are the best times for making the tests, as the sun is then at about its mean distance, but if made at other times of the year the error is practically so small as to be negligible. A slow "process" or lantern plate, backed, should be used and a quick shutter exposure given, and it is best to focus the camera on a distant terrestrial object, as it is somewhat difficult to focus on the sun itself on account of the glare. For every inch of focus the diameter of the sun's image = .0093 in.

An example will show the method. Supposing the image produced measures ·1 in = 1/10 in. diameter, then $\frac{\cdot 1}{\cdot 0093} = 10\,752$ in. = focal length.

Of course, one can equally well use the metric measures. For instance, supposing the equivalent focal length of a telephoto lens is required, and, after proceeding as above, the image measures 18 mm.,

Then $$\frac{18}{\cdot 0093} = 1935 \text{ m.m.}$$

The first example shows that a very useful rule to remember is that 10¾ in. of focus is required for every 1-10 in. of image of the sun's disc.

Don't use a focal-plane shutter in the summer for this, as a hole may be burnt in the material.

Trusting that this method will be of interest and somewhat novel.—Yours sincerely,

EDWARD W. PARVITT.

Tufnell Park, London, N.

THE ASSISTANT QUESTION.

To the Editors.

Gentlemen,—With reference to the assistant question, I should like to offer the following suggestions as a practical attempt to get something done instead, as seems to be the general attitude, of waiting for someone else to do it. If someone in London will take the matter up there, there is no reason why we should not succeed, and, once started, it should not be difficult to develop. I suggest that an organisation on the following lines would probably best meet our special conditions:—

(1) Every town where the number of assistants warrants it, such as Liverpool, Manchester, Leeds, etc., forms a local branch, which would deal with minor local affairs direct, and in other matters act in an advisory capacity and as local intelligence department of a county committee.

(2) Every county forms an association, composed of representatives elected by the whole of the members in the county, with an executive committee which could deal with matters affecting the county generally. In towns where there is no local branch the members would deal direct with the county committee.

(3) A national executive, with headquarters in London, which would deal with questions affecting assistants as a whole, and give its support, where necessary, to the county organisation in purely county affairs.

By an organisation on these lines (3) would give us a national standing, enabling us to deal directly with Government Departments, etc.; (2) would give us a strong body on the spot able to deal with authority and promptitude on county affairs, and supplied with up-to-date and reliable information by (1), which would ensure local conditions being fully understood and presented in the proper quarters.

So far as Liverpool is concerned, there is no need to go to any expense in hiring a meeting-room for a preliminary discussion. Any assistant sufficiently interested in his own welfare need only attend at the premises of the Everton Camera Club, 3, Village Street, at 3 o'clock on Thursday next, where he will find others eagerly awaiting his support.

But, for goodness' sake, *do something yourself*, and do *not* expect God to provide. He provides for the rich and powerful, no doubt, but the poor must provide for themselves.

Apologising for the length of this letter,

"ANOTHER HOPEFUL."

Answers to Correspondents.

SPECIAL NOTICE.

In accordance with our present practice a smaller space will be allotted to replies to correspondents.

We will answer by post if stamped and addressed envelope is enclosed for reply: 5-cent International Coupon, from readers abroad.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

M. M.—It is rather a doubtful point if you require a licence, but if you do the office to which you should apply is 99, Queen's Gate, South Kensington, S.W.7. They will advise you if it is required.

C. A.—We think the Retail Businesses (Licensing) Office for your district (Essex) is 80, Westbourne Terrace, Paddington. If this is not correct the Paddington office will forward it to the proper quarters.

R. S. R.—With artificial light the exposure varies in direct proportion to the power of the light, so that 3,000 c.p. would require double the exposure of 6,000 c.p., the same lens and plate being used. We should advise the diffusing arrangement to be about 4 ft. long, 2½ ft. deep, and 2 ft. front to back.

R. E. G.—So far as we understand the Trade Marks Act, you cannot register a word in reference to a business, but only in reference to some product which you make or sell. If you write to the Controller of Patents, 25, Southampton Buildings, Chancery Lane, W.C., you can get a circular of instructions for applying for a trade mark to be placed upon the register.

T. and Co.—Photographs are most usually printed on watch dials by the carbon process. If you write to the Autotype Co., 74, New Oxford Street, London, W.C.1, they will give you any information on specific points. The book on making ceramic miniatures is "Photographic Enamels," by R. D'Helicourt, published by Messrs. Iliffe and Sons, Ltd., 20, Tudor Street, London, E.C., price 2s. 6d.

S. B.—If you want fairly stiff celluloid, and wish to buy in fairly large quantities, the best firms are Messrs. Guiterman and Co., 35-36, Aldermanbury, London, E.C.2, and the Centuple Manufacturing Co., 55, Wilson Street, London, E.C. Celluloid of very much thinner substance is sold by Messrs. Rheinlander and Son, New Malden, Surrey, who perhaps could also supply the stiff in small quantities.

J. G.—The plan you suggest would not mend matters. What you want to do is to fix up some kind of open-ended muslin tent or tunnel against the tablet, pointing the camera into the tunnel, so to speak, in making the photograph. If you can rig up this arrangement, then you can use flashlight with advantage on one or both sides of the tunnel as necessary to reduce the length of exposure or give relief to the lettering.

W. H.—In order to make photographs, either by artificial light or daylight, with the effect of fireside lighting, you want an artificial fireplace through which the day or artificial light can be admitted, and which is used in conjunction with general illumination in the room. The best advice we can give you is to write to the Vanguard Co., Maidenhead, for reprint of an article from the "B.J." on this very subject. It is obtainable free.

F. O'B.—With so small a working space as 15 ft. you must not have a longer focus lens than 8 ins. This is allowing 5 ft. for the sitter and for space behind the camera. If you can make do with a foot or two less for these purposes you could have a 9-in. lens, which would be better. As 8 ins. is a short focus for covering a half-plate, the lens would have to be of the anastigmat type, *e.g.*, one of the *f*/4.5 anastigmats.

W. M. M.—The best answer we can make to your question is to refer you to the Secretary of the Edinburgh Professional Photographers' Association, Mr. Felbam Moffatt, 125, Princes Street, Edinburgh. This association has recently been taking up the

question of apprenticeship and of instruction to photographic assistants, and from among its members, or from among other photographers, could perhaps give you the help you want.

D. and H.—1. We think you can get the kind of half-watt lamps you require from the Thornton-Pickard Manufacturing Co., who supply one for moderate degrees of enlargement. 2. We have sent you the table you refer to, taken from an old "Almanac," but we have discontinued inserting it for the reason that the indications are absolutely without any value owing to the different ways in which H. and D. numbers are supplied by different plate-makers.

J. E. L.—For the highest class of half-tone blocks most photo-engravers prefer a toned P.O.P. print of glossy surface, although glossy untoned bromide prints are very largely used chiefly for blocks of somewhat coarser ruling used for newspaper illustration. In the case of reproduction in collotype and photogravure, it is usual for the negatives to be placed with the reproduction firm for them to make prints or transparencies for their purpose.

R. L.—You can probably get a new spindle from either Mr. R. E. Feeling, 4-5, Holborn Circus, London, E.C., or from Mr. H. T. Ball, 54, Berwick Street, Oxford Street, London, W.1. There are scores of patents for focal-plane shutters. Your only course would be to search through the specifications at the Stirling Library in Glasgow with the help of the sectional classified indexes, which are issued by the Patent Office to institutions where the specifications are on view.

F. J.—We are afraid there is no ready means of treating prints so that they will curl in the opposite direction. Usually prints are put to dry on a net, stretched on a frame, with the film surface in contact with the net, and when fairly dry, but still limp, are put under pressure between glass plates for a few hours. If treated in this way they will remain fairly flat. Mr. Stokes, in the article which we printed in our issue of October 17, described a press for applying the pressure.

A. D.—1. We are not sure, but we think the paper is made by Cassio, Ltd., Watford, Herts. The firm previously had the name of Baryta, Ltd. 2. About the best plan, although it is tedious, is to squeegee gelatine prints over the whole surface of the glasses, and then get them off again either by stripping (if they will strip) or by soaking in hot water, if they won't. This seems to get glasses into proper condition better than any other method, but it might be worth while first to try scrubbing the glasses with a little strong nitric acid, which you can best apply with some glass wool, purchasable from a chemist's.

A. H. S.—1. You will find ordinary glazier's putty the easiest to use for repairing the balustrade; after you have mended all the holes, give the whole thing a coat of lead colour paint, well thinned with turpentine; this will prevent gloss. If you buy the paint in a tin, do not shake it, but pour off the oil and thin the thick paint with turpentine only. 2. The false lights in the eyes show that you are not careful in placing your reflector. You can see the lights on the ground glass before you expose, so that you must move the reflector or the sitter until they disappear. If the reflector is not at fault, it may be some other white object in the studio.

W. S.—1. Few quarter-plate reflex cameras have a big enough front to take an 8-in. $f/4.5$ lens. Our experience is that there is not a very great practical advantage in having an 8-in. lens of such large aperture. For the sake of depth, it so often happens that you have to stop down, so that you might just as well content yourself with, say, an $f/6$ lens, at which aperture you could get the focal length that you are seeking. 2. We do not think very much of either of your pyro-soda formulæ, as we do not agree with the practice of mixing the sulphite and carbonate together in the B solution. If this is done, the sulphite deteriorates very much more rapidly, and does not then preserve the mixed or working developer so well.

R. R.—We do not know of any single lamp which will give a properly diffused light for portraits which will permit of $\frac{1}{4}$th second with a lens working at $f/7.7$. As some indication of the power of the half-watt lamps we would say that with six 1,000 c.p. lamps and a lens working at $f/3.5$ we have obtained good negatives in $\frac{1}{4}$ second. The enclosed arc gives a more actinic light than the half-watt, and a single large Westminster lamp would come nearest to your requirements. If this is placed in the position shown in your sketch it should give fairly good light. Have the lamps to raise and lower, as by lowering you will be able to give shorter exposures for sitting figures and children than if at full height, which should be about 7 ft. 6 ins. to the arc. Our advice is to get a quicker lens if you must give such brief exposures. The decoration of the studio will tend to make the most of the light.

W. G. A.—1. Without knowing anything of the situation and surroundings of the studio, we advise you to use plain glass with casement curtains over it. The alternative is to have ground-glass or ribbed glass, but both of these obstruct light and may cut down your light at times of the year when it will be a great disadvantage. It is impossible to say more without knowing the compass bearings of the studio, and whether it is shut in from any quarter by other buildings. 2. A panchromatic plate and screen is of no advantage. The best plate for the purpose is one of the slow landscape variety of about 50 to 100 H. and D. A process plate is rather too slow. 3. Theoretically the back should be swung so that the plate is vertical, but very often it is an advantage for the sake of depth of focus at a large aperture to disregard this and to do so usually has no ill effect upon the "drawing" of the portrait.

G. S. L.—So far as we know, the pressmen have no secret methods. Probably in circumstances such as you mention a lens-aperture of $f/4.5$ would be used, and for the sake of depth a much smaller camera than half-plate, say 5 by 4, $\frac{1}{4}$-plate, or even one of the Verascope cameras such as are commonly used for portraiture in the bad light of the Law Courts, in each case resort being had to enlargement up to half-plate or whole-plate size. We doubt if it is customary to use a much more rapid plate than yours, although for exceptionally bad conditions a very fast plate is undoubtedly of value. Nevertheless the value of ultra speed can be over-rated, since you cannot do so much in the way of "forcing" the exposure in development. Probably the pressmen use most of their skill in developing, pyro-metol used about half-strength and distinctly warm, about 70 degs. F., being employed, together with some patience, in getting the utmost out of the exposure. So far as we know, there is nothing for it but combining methods on these lines.

The British Journal of Photography.

Line Advertisements.

Charges for Insertion.

Since advertisements cannot be inserted until fully and correctly prepaid, senders of line announcements are asked to bear in mind the scale of charges. They will thus save themselves delay in the publication of their announcements. A Schedule by which an advertisement can be correctly priced will be sent on request.

Net Prepaid Line Advertisements.

12 words or less	1/-
Extra words	1d. per word.

(No reduction for a series.)

Special Note. Box Number Advertisements.

"Box No." and office address	charged as 6 words.
For forwarding replies add ...	6d. per insertion for each adv't.

If replies are called for this latter charge is not made.

Advertisements cannot be inserted until fully and correctly prepaid.

Orders to repeat an advertisement must be accompanied by the advertisement as previously printed.

Advertisements are not accepted over the telephone or by telegram.

The latest time for receiving small line advertisements is 12 o'clock (noon) on Wednesdays for the current week's issue.

Displayed Adv'ts should reach the Publishers on Monday morning.

The insertion of an Advertisement in any definite issue cannot be guaranteed.

HENRY GREENWOOD & CO., Ltd., Publishers,
24, Wellington Street, Strand, LONDON, W.C. 2.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3109. Vol. LXVI. FRIDAY, DECEMBER 5, 1919. Price Twopence.

Contents.

	Page
Ex-Cathedra	705
Licences for New Retail Businesses	706
Practicus in the Studio. By Practicus	707
A Modified Bleacher in Chromium Intensification. By Raymond E. Crowther	709
Bribing the Children. By Ernest A. Dench	710
Assistants' Notes	711
Exhibitions	712
Patent News	712
Meetings of Societies	712
Commercial and Legal Intelligence	713
News and Notes	714
Correspondence— The Assistant Question—Negative Bromoils—Quantity Tank Development—War Work of the Eastman Research Laboratory — The Assistant Question—Mounting Blocks to Point Measures	714
Answers to Correspondents	716

SUMMARY.

In some notes on the chromium intensifier Mr. Raymond E. Crowther discusses the recent paper by MM. Lumière and Seyewetz, and points out that a solution made up with potassium bichromate and hydrobromic acid is an effective bleacher in the process. (P. 709.)

Many inquiries continue to reach us in regard to the licence which is necessary for the starting of a new retail business such as a photographic studio. In a leading article we endeavour to make clear what is the present position under the Retail Businesses (Licensing) Order, and offer our opinion on one or two of the debateable cases which have arisen. (P. 706.)

The article this week by "Practicus" deals with some of the less appreciated points in connection with bromide printing. Our contributor lays stress on freedom of the developer from hypo, and has some hints to give on the improvement of defective bromides by toning and other means. (P. 707.)

Some of the expedients of American photographers in interesting children in the productions of their studios are the subject of an article by Mr. Ernest A. Dench. (P. 710.)

Some of the thin glass which is now being used for plates of fair size may easily be broken in use. One or two precautionary measures are the subject of a paragraph on page 705.

Low temperature in developing during the present cold weather may easily be confused with under-exposure as regards its effects. (P. 706.)

At the Royal College of Science Chemical Society last week a bath which fixes plates in thirty seconds was demonstrated. A brief report of the meeting appears on page 711. A result of this kind is probably obtained by addition of accelerators of fixing to the hypo. (P. 705.)

At the next annual meeting of the Royal Photographic Society the question of raising the subscription to members who join after December 31 next, and who reside within thirty miles of London, will come up for discussion. (P. 708.)

"Colour Photography" Supplement.

In a contributed article Mr. R. M. Fanstone has some practical hints to give on the making of lantern-slides by the Autochrome and, particularly the Paget, screen-plate processes. (P. 45.)

Particulars have now been filed at the Patent Office, where they are available for inspection, of the colour process associated with the name of the Russian inventor Prokudin-Gorsky. (P. 48.)

Detailed particulars have been given in a recent specification of Mr. J. T. Smith of a method of making two-colour screen-plate filter films of a degree of fineness which, it is claimed, is sufficient for cinematograph projection (P. 46.)

EX CATHEDRA.

Rapid Fixing. On another page will be found a short report of a meeting of the Royal College of Science Chemical Society, at which Mr. K. Hickman demonstrated the use of a fixing bath of his invention which was shown to fix effectively in 30 seconds. Without knowing more than is contained in the report, it may be surmised that this result is obtained not by the discovery of a more energetic fixing agent than hyposulphite of soda, but by addition of other substances to a hypo fixing bath of maximum fixing power. The late Mr. Welborne Piper carried out and published in these pages a large number of experiments on this question. Having found that the strength of hypo solution which fixes most quickly is one of 40 per cent., he proceeded to test the effect, as regards speed of fixing, of various additions, and found that ammonium chloride and ammonium sulphocyanide are two salts which increase the speed of fixing to a substantial degree. Of the two, ammonium chloride is the most satisfactory; the softening action of ammonium sulphocyanide on gelatine is a serious objection to its use, although, apart from this, it permits of very rapid fixation. With ammonium chloride, on the other hand, a hypo bath of 20 per cent. strength containing from 2½ to 5 per cent. ammonium chloride was found to fix in two minutes, which is getting fairly close to the result obtained by Mr. Hickman.

* * *

Thin Glass. We do not yet appear to be receiving anything like pre-war supplies of glass, judging from the thickness, or rather thinness, of some of the larger sizes of plates. We recently opened a box of 10 x 8 plates which were about the thickness which would formerly have been classed as "extra thin for use in sheaths" for hand-camera work. Considerable care is necessary to carry through the ordinary operations of development, fixing and washing, but it is only in the printing-room that actual danger appears. The slightest inequality in the printing frame or a very slight jar is often sufficient to cause a fracture, with all the attendant trouble of binding up, dodging in printing, and spotting the copies. It is a wise precaution to have all frames fitted with a piece of patent plate or at all events a good stout cleaned-off negative glass. This is a great protection and will often save the negative in the event of the frame being dropped. In order that the glasses may be always kept in position it is a good plan to wedge them in with strips of wood dipped in seccotine or other glue. Such glass also serves to keep the pads and backs of the frames clean and flat, while they are also useful for supporting small negatives which are to be vignetted upon large paper. For this purpose a thin card frame to keep the negative from slipping about will be found very convenient.

Cold Solutions and Shadow Detail. It is not fully realised by many photographers that with the approach of the colder weather they should give special attention to the temperature of their solutions. In the case of plates, not only does development with a cold solution take a very long time, but when this condition exists certain ingredients of the developer such as hydroquinone almost cease action altogether. If the solutions are kept in an unheated dark-room care should be taken to see that they are not used at a temperature lower than 50°. We have seen negatives developed with a cold solution which though possessing full density, were lacking in the shadow details and gave the impression that they were considerably under-exposed when the reverse was actually the case. It is a good plan to add a very small quantity of hot water to each lot of developer and fixing solution or to stand the bottles in a warm room for some time before use. Of course, if the dark-room is properly heated the solutions will never fall below an effective working temperature, and this latter is the proper course to be followed for the sake of the plates, no less that for the mere comfort of those who handle them.

LICENCES FOR NEW RETAIL BUSINESSES.

The ministerial order which goes by the name of the Retail Businesses (Licensing) Order is one of those pieces of emergency war legislation which has not been repealed, and appears now, if our correspondence is any evidence, to give rise to more inquiries and doubts than in the early stage of its existence. Although it was recently mentioned by the Minister of Labour in the House of Commons that the question of dispensing with the necessity of obtaining licences before retail businesses could be opened was "under consideration," that explanation, like many other official replies in the same form of words, may be taken for what it is worth. We were informed not very long ago by an officer employed in the administration of the Order that it would certainly remain in operation until March next. Inasmuch, therefore, as questions continue to reach us every day raising some point or other connected with the Order which is of real importance to those setting up in business for themselves, it will be of service if we review the question again and particularly refer to some of the more debatable cases which have been brought to our notice. Before doing so we may briefly refer to the relation of the Order to photographic businesses.

So far as its connection with photography is concerned the history of the Order is one of muddle. The Order, originally made by the Ministry of National Service in February, 1918, was obviously designed for the protection of men absent on military service. It was intended to protect them from other persons stepping into their places by opening up businesses to replace those which had been compulsorily closed through their owners' absence on service. This was an altogether admirable project, but the surprising thing about it was that for some obscure reason photographic studios were held to be exempt from the application of the Order unless frames and other photographic goods were sold. On the broad question there was no earthly reason why a photographic studio should not have been classed with other retail businesses. It is so classed by the Inland Revenue authorities and under the Shops Act, and a more or less definite inference that it would come under the Order was provided by the mention of the fact that a hairdresser's business is a retail business within the meaning of the Order. Under the Shops Act the business of a hairdresser and a photographer are specifically associated as coming within the Act, and therefore there was a reason for assuming that the same would be the case under the Retail Businesses (Licensing) Order. Apparently, however, some legal stupidity caused the exemption of photographic studios from the Order, and it was not until August last, as the result of a question in the House of Commons, that photographic studios were brought within its scope. In many towns it was thus a case of shutting the stable door when the horse was gone. Men, at length demobilised from the Army and returning to re-open their businesses, found that others had been allowed to step into their shoes in their absence. Although this decision of the Ministry of Labour, to which the administration of the Order was transferred in May last, provides protection to ex-Service men against businesses started, or proposed to be started, since August last, it is evident that nothing could be done in respect to those businesses which had been opened between February, 1918, and August, 1919, that is, during the unfortunate period of exclusion of studios from the operation of the Order.

As things stand now, anybody, whether British or alien, demobilised or otherwise, who wishes to start a new business requires to obtain a licence for doing so. Apparently the definition of what is a "new" business is by no means clear. The original Order of the Ministry of National Service defined it as one started after February, 1918. The Order, on its re-issue by the Ministry of Labour, defined a new business as one started after May 30, 1919. Nobody seems to know which of these definitions is the correct one. The natural assumption is that the first is correct, since the Order of the Minister of Labour simply amounted to no more than a transfer of executive power from one Ministry to another, but with a culpable lack of common sense in failing to perceive that the definition of a "new" business was entirely altered by the wording of the second Order. Anyone now requiring to start a new retail business needs to apply to one or other of the administrative branches established for carrying out the Order in different parts of the kingdom. We give the list of these branches at the foot of this article, and explain here that in making application for a licence the office selected should be that which deals with the place or district where the business is to be established; the place of residence of the applicant, at the time of making application, is immaterial.

The term "retail business" defines sufficiently well the various kinds of photographic business which come within the scope of the Order. These are, for example, not only regular photographic studios and businesses dealing in photographic requisites, but any kind of photographic business which is carried on with the people resident in a given district. It thus applies to a photographer who makes photographs of people at their houses or secures orders within the district of his place of residence, for the making of enlargements from photographs or for photographing houses, factories or manufactured articles; in other words it applies to all those photographic businesses where the people of the district can buy from or employ a photographer with practically the same readiness as they can buy something at a shop. On the other hand the Order does not apply to businesses which are carried on solely with other trades. For example, a retoucher working for photographers either in the same town where he lives or in other towns does not require a licence, nor does a photographer whose business consists in the developing and printing of plates or films when such business is obtained from other taders in his neighbourhood or even, we think, when it is obtained, e.g., by advertisement, from amateurs scattered throughout the country. This latter case embodies a certain element of doubt. If people living in the neighbourhood of the business could take their plates or films to be finished in the same way that they could buy goods from a local shop, we should say that the administrators of the Order would consider the business one requiring

a licence. Another difficult case is that of a photographer who travels from place to place, taking photographs or groups or canvassing for orders for enlargements. We have no knowledge of how the administrators of the Order are dealing with such cases, but we imagine that under the Order they have power to require a licence from a photographer who plants himself down, say, with a caravan, in a place, carries on a business there in the way of taking and delivering photographs, and then moves on to somewhere else. A licence is supposed to be granted for a business to be carried on at a given place, and therefore it is to be assumed that in theory the travelling photographer would require to have one applying to every place where he makes a halt. On the other hand, there is apparently no power under the Order for restraining a photographer who obtains a licence for carrying on a business at some address from extending his operations within any selected area by canvassing or other means.

The following are the London and provincial headquarters of the administrative staff of the Order, together with the divisions of England, Scotland and Wales to which they apply:—

99, Queen's Gate, South Kensington, S.W.7.—London and South-Eastern (City and Metropolitan Police District, Kent, Surrey, Sussex).
5A, Union Street, Bristol.—South-Western (Gloucester, Wilts, Dorset, Somerset, Devon, Cornwall, Hants, Isle of Wight).
Harewood Barracks, Woodhouse Lane, Leeds.—Yorks and East Midlands (Notts, Yorks (excluding Cleveland), Derby (excluding Glossop and New Mills), Lincoln).
Queen's College, Paradise Street, Birmingham.—West Midlands (Staffs, Shropshire, Hereford, Worcester, Warwick).
80, Westbourne Terrace, Paddington.—South Midlands and Eastern (Norfolk, Suffolk, Cambridge, Oxford, Huntingdon, Bedford, Berks, Bucks, Northants, Leicestershire, Rutland, Herts, Essex).
New Arts Buildings, Liverpool.—North-Western (Lancashire, Cheshire, Derbyshire (Glossop and New Mills District), Isle of Man).
47, Pilgrim Street, Newcastle-on-Tyne.—Northern (Northumberland, Durham, Cumberland, Westmorland, Yorkshire (Cleveland District)).
27, Bute Street, Cardiff.—Wales (all Wales and Monmouthshire).
15, Athol Crescent, Edinburgh.—Scotland (all Scotland).

PRACTICUS IN THE STUDIO.

[Previous articles of this series, in which the aim of the writer is to communicate items of a long experience in studio portraiture, have appeared weekly since the beginning of the present year. It is not thought possible to continue the series to the length of that by the same writer which ran through the "British Journal" some years ago, but if any reader among the younger generation of photographers, and particularly those engaged as assistants, has a particular subject which might be dealt with, his or her suggestion will be welcomed. The subjects of the previous articles of the series have been as follows:—

A Talk About Lighting (Jan. 3).
The Camera and the Lens (Jan. 10).
Managing the Sitter (Jan. 17).
Backgrounds (Jan. 24).
Studio Exposures (Jan. 31).
Artificial Lighting (Feb. 7).
Printing Processes for Portraiture (Feb. 14).
Studio Accessories and Furniture (Feb. 21).
The Surroundings of the Studio (Feb. 28).
Studio Heating and Ventilation (March 7).
The Postcard Studio (March 14).
The Printing-Room (March 21).
About the Reception Room (March 28).
Home Portraiture (April 4).
Portable Studios (April 11).
Copying (April 18).
Handling the Studio Camera (April 25).
More About Lenses (May 2).
Enlargements (May 9).
Advertising the Studio (May 16).
Mounts and Mounting (May 23).
Business Methods (May 30).
Photographing Children (June 6).
Portraits of Elderly People (June 13).
Something about Lenses (June 20).
Hand Cameras for Professionals (June 27).
The Dark-Room and Its Fittings (July 4).
Plates and Their Work (July 11).
Apparatus Repairs and Renovations (July 18).
Posing the Head (July 25).
Intensifying Portrait Negatives (Aug. 1).
Workshop Jobs (August 8).
The Personal Factor (Aug. 15).
The Keeping of Negatives (Aug. 22).
Reduction of Negatives and Prints (Aug. 29.)
Leaky Roofs (Sept. 5).
Blinds and Curtains (Sept. 12).
Miniatures (Sept. 19).
Printing Portrait Negatives (Sept. 26).
Wedding Groups (Oct. 3).
Combination Printing (Oct. 10).
Flashlight Work (Oct. 17).
Flashlight Portraiture (Oct. 24).
The Question of Outfit (Oct. 31).
Telephoto Lenses for Professional Work (Nov. 7).
Changing Quarters (Nov. 14).
Carbon Printing—I. (Nov. 21).
Carbon Printing—II. (Nov. 28).

BROMIDE WRINKLES.

Theoretically, there is no simpler process for producing photographs than bromide printing, but one does not go far in practice before finding out that it is not quite so easy to produce good prints as it looks, quite a number of ways of spoiling paper being open to anyone of average ingenuity. I, therefore, assume that my readers are conversant with the ordinary routine of exposure, development and printing and take up the story where trouble begins.

Dirty margins frequently appear with some workers and rarely with others, showing that the manipulation rather than the material is faulty. Sometimes in the case of a vignette one finds a brownish and grey fog extending half-an-inch or more from the edge and sometimes the entire margin up to the image is more or less degraded. With some papers the stain is of quite a bright orange yellow, and may even extend over what should be white portions of the image itself. This defect is usually caused by forcing the development of an under-exposed print, and is more likely to occur if the paper is rather stale than when it is quite fresh. It may, as a rule, be avoided by giving a fuller exposure and increasing the amount of bromide in the developer. Great care should be taken to avoid contaminating the developer with hypo: a very small trace of this will cause stains, as witness the yellow corners which frequently appear upon the corners of enlargements which have been pinned up by hypo-contaminated fingers. Those who print in P.O.P. realise what a small trace of hypo will spoil a print, but it is not so generally recognised that the same thing occurs in a lesser degree with bromide paper. It is a curious thing that a large number of people do not see that if the dark-room towel is used to dry fingers dripping with fixing bath the hypo so carried into the fabric will later on contaminate fingers which have been carefully washed. I have repeatedly seen

printers turn over a batch of prints in the fixing bath and dry their fingers on the towel without rinsing them first, then after removing the prints to the washing bath carefully wash their hands, dry them upon the hypo-soaked towel, and start on making more exposures. Fortunately, most stains so caused will yield to the iodine-cyanide reducer, to which I shall presently refer.

A general muddiness or dinginess of the whole print is often caused by using a developer which has become oxidised either by too prolonged use or by allowing development to go on while holding the print in the hand. This is frequently seen when an attempt is made to develop a sky or other light portion of a print locally, the remainder having been slightly rinsed or even left with the exhausted developer upon the surface. Some paper makers recommend transferring the print directly from the developer to the fixer without rinsing. This carries a large quantity of developer into the hypo and dirty-looking prints will result if the hypo bath be not frequently renewed. As a rule, when acid fixing baths are used they are overworked, and many failures in sepia-toning may be traced to this cause, the print when toned appearing to be upon cream paper instead of upon white.

Much may be done to save stained prints by using a clearing solution. I have found none so satisfactory as iodine and cyanide. To make this I keep two stock bottles: one a 5 per cent. solution of iodine in iodide of potassium, and the other a 5 per cent. solution of cyanide of potassium. For use, about ten minims of each are added to an ounce of water, the strength being regulated to suit the work in hand; more of each solution is necessary for deep stains, and less for removing a slight general fog. With practice it is quite easy to effect local reduction by using a pad of cotton-wool dipped in a fairly strong solution. I have often turned a solid print into a vignette in this way, put lights in on clouds in a sky, and even removed portions of the image from the centre of the subject where a clean surface was required for working up. This reducer is the only one, as far as I know, which will act upon a sepia-toned image, but I would recommend that any cleaning-up or reduction should be done before toning, as the untoned image is more readily dissolved.

A print which is flat and heavy-looking all over may be greatly improved by having the lights brightened up with a solution of iodine followed by a plain hypo bath. To do this we take enough water to cover the print, and add to it enough of the 5 per cent. iodine solution to give a sherry colour; on immersing the print the back of the paper will at once turn to a deep blue colour, but the gelatine side will not change colour for a minute or two. When the high-lights turn to the blue colour the print is rinsed and transferred to a 15 per cent. solution of plain hypo; the blue will immediately disappear, and the image will appear brighter. If the reduction be not sufficient after five minutes in the hypo the print may be well washed till free of hypo, and the process repeated. If the iodine solution be too strong there is a tendency for the half-tones to be eaten away and the print made harsh-looking. This method of reduction has been recommended for obtaining bright prints from thin flat negatives, the print being rather over-exposed, fully developed and cleared with the iodine and hypo.

The ordinary ferricyanide and hypo reducer may be used in the same way as the mixed iodine and cyanide, but there is a possibility of the reduced portions becoming a different colour from the rest of the image, this being specially likely to occur when a weak hypo solution is used. I have found a clean 15 per cent. solution of hypo tinged a full lemon yellow with a 10 per cent. solution of ferricyanide of potassium to give the most satisfactory results.

To obtain good sepia tones, bromide prints must be fully developed, at least a minute's development being necessary, while two or even three minutes are needed for really rich tones. Fixing in clean hypo must be thorough, and all trace of hypo removed by washing. Even a slight trace of hypo will unite with the ferricyanide and reduce a good print to such an extent that it will not darken properly in the sulphide. Weak sulphide solution is a common cause of bad tones. If the paper will stand it without blistering, I prefer a working strength of one part of sulphide in fifty of water, instead of one in a hundred as generally recommended. Prolonged immersion in weak sulphide will not give the same result as a shorter time in a stronger solution. Liver of sulphur, or "potassa sulphurata," as it is called by the chemists, is an excellent one-solution toner with some brands of paper, but it is not suitable for others. In some cases I have been able to get any colour from a warm black through various shades of brown to a warm sepia, but in others I have not been able to get beyond a purple black similar to a deeply-toned P.O.P. The process is very simple, and resembles hypo-alum toning, as the solution is used warm and only a single solution is needed. The formula is: liver of sulphur, 60 grains; water, 15 ozs.; ammonia 10 minims. This is used at a temperature of about 100 degrees Fahr. Some papers will tone without preliminary hardening, but most brands should be treated with a 5 per cent. formaline solution for five minutes, or the film will dissolve. The toning is continuous, and the print may be removed at any stage. It should be noted that the toning continues in the washing, so that the print should be taken out before the desired colour is reached. I have found that much weaker prints may be successfully toned in this solution than by the ordinary sulphide process, but the paper must be suitable.

Rusty coloured prints, which are sometimes inevitable when printing from very hard negatives which must be over-exposed and under-developed, may be greatly improved by toning in an ordinary gold and sulphocyanide bath, as used for P.O.P. The print on being immersed in this will slowly turn to a pure black or grey, and if left in too long to a bluish slate colour. It is desirable to fix in a weak hypo solution after toning to prevent any possible change of colour, but I have found prints not so treated to stand very well.

Another method which I can strongly recommend is to use the ordinary chromium intensifier, which will usually transform a poor, washed-out print into quite a brilliant one. The bleaching bath consists of potassium bichromate, 10 grs.; hydrochloric acid 5 minims; water, 1 oz.; after bleaching, the print is washed until the whites are pure and then re-developed in an ordinary amidol or metol-hydroquinone developer. It is necessary to expose the bleached print to daylight during or after bleaching or the image may refuse to blacken.

PRACTICUS.

THE LATE SILVANUS THOMPSON.—The many admirers in photographic circles of Professor Silvanus Thompson will be interested in noting the announcement that his "Life and Letters," by Jane S. Thompson and Helen G. Thompson, are shortly to be published by Mr. Fisher Unwin. The volume will contain appreciations of his work as physicist, teacher, writer, artist, and "prophet." Professor Thompson was given to expressing his thoughts vigorously, and a representative collection of his letters should make exceptionally interesting reading.

ROYAL PHOTOGRAPHIC SOCIETY.—The annual subscription to the Society may shortly be doubled. At a recent council meeting, on the suggestion of the revenue committee, it was agreed to ask the members at the annual general meeting to alter the articles of association to the effect that members residing within thirty miles of Charing Cross and elected after December 31, 1920, shall pay an annual subscription of £2 2s. Members residing beyond that radius, or elected before that date, to pay £1 1s., as at present, the Fellowship subscription to remain at £2 2s.

A MODIFIED BLEACHER IN CHROMIUM INTENSIFICATION.

The revival of interest in the "chromium" intensification process evinced by the recent publication in this journal (1) of the preliminary results of a research by MM. Lumière and Seyewetz will be welcomed by those who employ this excellent process. To those who value the quality of permanence, which characterises the chromium intensified image, it is not a little surprising that this process has not completely replaced the many which make use of mercury compounds. The further advantage of being able by a slight modification to use the process for the reduction of excessive contrast in a negative (2) does not seem to have much weight with the average photographer—a truly conservative individual—to whom the only change which is worth serious consideration is one which "makes things easier." It may be safely predicted, therefore, that the chromium intensification process will become the popular process when it is less trouble to work than any other.

Before ideal simplification can be attained, however, much spade work in the form of research has to be carried on, work which adds to the sum of knowledge in other branches of science as well as that with which it is more directly concerned. For example, MM. Lumière and Seyewetz have advanced a tentative theory to account for the operation of the substances used in the process under consideration; should they be able to bring forward sufficient evidence to substantiate their assumptions, fresh light will be thrown on the constitution of chromites and a valuable addition to our knowledge of the chemistry of chromium will have been made.

One of the considerations on which their theory has been enunciated is the fact that chlorochromates are efficient bleachers in this process, whereas no bleaching takes place if the reddish-brown crystals obtained by acting on a bichromate with *hydrobromic* acid are used. Theoretical considerations would lead one to anticipate such results, for no bromine compounds analogous to the chlorochromates have been prepared. Nevertheless, hydrobromic acid will efficiently replace hydrochloric acid in the bleaching bath. A negative treated with the following solution:—

Potassium bichromate	5 grs.
Hydrobromic acid (25 per cent.)	5 minims.
Water	1 oz. fl.

is effectively bleached, and if after removal of the bichromate stain by washing, the bleached image is developed in the ordinary way a black, strongly intensified image results.

The following points in this modified process are perhaps worthy of mention:—

(*a*) The bleaching is quite as rapid as that of a bath containing an equivalent amount of hydrochloric acid—in fact, it appears to be somewhat more rapid, but the difference in speed observed may be ascribed to difference in the physical condition of any two negatives rather than to any specific difference in the bleaching bath.

(*b*) The buff colour of the bleached image is more pronounced when hydrobromic acid is used than when an equivalent of hydrochloric acid is employed.

(*c*) The amount of intensification appears to be greater in the case of the hydrobromic acid bleaching bath, but the difference in this respect between the two acids is not perhaps sufficient to justify the use of the more expensive hydrobromic acid.

Now, whilst this modification of the chromium intensification process is perhaps of little practical importance, it is worthy of some attention from the point of view of theory, for it indicates that although a solution of a chlorochromate may be used for intensification purposes, it is not necessary to assume that the chlorochromate *per se* is the active agent, as was suggested by Piper and Carnegie (3). The following alternative theory of the bleaching action is supported by results obtained by the writer, a note of which has been published elsewhere (4).

It is generally assumed that when hydrochloric acid is added in relatively small amounts to aqueous solutions of bichromates an equilibrium is set up by virtue of which chlorine in the nascent condition is obtained. This chlorine may be brought into the ordinary or gaseous condition by the simple expedient of boiling the mixed solutions, when something like the following reaction occurs:—

$$K_2Cr_2O_7 + 14\,HCl = Cr_2Cl_6 + 2\,KCl + 7\,H_2O + 3\,Cl_2.$$

If, however, instead of removing the chlorine by heat, metallic silver be placed in contact with the solutions, the chlorine is removed thereby, and at the same time a chromic salt is produced. When the solution is of the strength which is used in intensification the amount of hydrochloric acid is insufficient for the formation of a normal chromic salt, consequently a hydrated or basic insoluble salt is formed in the film contiguous to or surrounding the silver chloride (5).

An objection to this conception might be urged that, whereas the bleached image is of a brownish hue, the fullness of colour being roughly inversely proportional to the concentration of hydrochloric acid present in the bleaching bath, buff coloured hydrated chromic salts are unknown.

There is no doubt whatever that the buff colour of the bleached image is not contributed by the chromic salt. The writer's experiments already referred to, which were conducted on silver mirrors, and in which analyses of the bath and the "bleached" film were made, clearly demonstrated that chromic acid, CrO_3, disappeared from the bath and was present *as such* in the "bleached" film. For reasons which, although affording definite evidence on the point, need not be gone into in the present communication, it may be assumed as highly probable that the basic chromic salt adsorbs chromic acid, and that the buff colour of the bleached image is due to this adsorbed component. Bothamley (6), whilst apparently unaware of the writer's experiments, has offered a similar explanation, but his conclusions are somewhat discounted by the fact that the buff colour is attributed to the presence of chromic chromate—a compound the existence and constitution of which are still subjects of controversy.

Confirmatory evidence of this adsorption phenomenon has since been obtained by the author in a large scale operation in which an oxidation with a bichromate is conducted in a gradually increasing concentration of sulphuric acid. In this case, until the concentration of the sulphuric acid reached a definite minimum, the oxidised insoluble product was contaminated with adsorbed chromic acid, which latter was present in decreasing amounts as the mineral acid content of the oxidising solution increased in concentration above the minimum.

These considerations apart, the theory advanced by MM. Lumière and Seyewetz is somewhat discredited by the constitutional formulæ which are given in support of it. The compound referred to as a double chromite, and which is assumed

(1) "B.J.," 1919, p. 451.
(2) "B.J.," 1919, p. 465.
(3) "Amateur Photographer," 1904, xl., p. 399.
(4) "Journal Soc. Chem. Ind.," 1916, xxxv., p. 817.
(5) Piper and Carnegie have observed that silver in contact with a solution of chromic chloride is attacked and converted into the chloride with simultaneous formation of a basic chromic salt.
(6) "Photographic Journal," 1918, No. 2, p. 53.

to exist as such in contact with a bichromate, has the formula

$$CrO_2 \begin{cases} Om \\ Ag+ \end{cases}$$

ascribed to it.

Two objections to this formula may be cited:—

(a) Chromites are generally assumed to be constituted according to the general formula CrO.OM, and no amount of rearrangement will enable MM. Lumière and Seyewetz's formula to be so written.

(b) The electro-positive element silver (Ag+) has deported itself as an electro-negative element having replaced the electro-negative element chlorine (Cl−) of the chlorochromate

$$CrO_2 \begin{cases} Om \\ Ct \end{cases}$$

Whilst such dual deportment is well known as a characteristic of many of the elements, there is no known instance of silver so behaving. These are the days, however, of the rough handling of generally accepted theories, and until further work has been done on the question it would be unwise to affirm that the constitution ascribed by MM. Lumière and Seyewetz to the chromium element of the bleached image is an impossible one.

Nevertheless, the efficacy of hydrobromic acid in conjunction with a bichromate may legitimately be regarded, in the writer's opinion, as confirmatory evidence of the views herein reiterated; for just as the usual bleaching bath may be regarded as a solution containing nascent chlorine, so may a bath made up with hydrobromic acid be regarded as a solution of nascent bromine. This nascent bromine by attacking the silver of the image or mirror, as the case may be, and converting it into silver bromide, is removed from the sphere of action and the reduction of the bichromate to a basic chromic salt becomes a static condition, with ensuing adsorption of chromic acid. The subsequent action of the developer simultaneously reduces the silver bromide to silver and the chromic acid to hydrated chromic oxide, or more probably to chromic hydroxide.

Further experiment should readily decide between the two theories, for the amount of developer consumed in the final development will be appreciably greater for a given amount of original silver in the case of the bleached image being an adsorption complex than if the chromium be present in the image in such combination as suggested by MM. Lumière and Seyewetz.

The writer hopes at an early date to be able to continue his experiments the results of which, when taken in conjunction with those of other workers on the subject, may possibly afford positive evidence on the constitution of the compound known as chromic chromate, and should certainly allow of a clearer understanding of the reactions which occur in the chromium intensification process.

RAYMOND E. CROWTHER.

BRIBING THE CHILDREN.

CHILDREN are more susceptible to bribery than anybody else, crooks excepted. We cannot, of course, put children in the same category as crooks, for the good and simple reason that youngsters are totally innocent of any wrongdoing. If it is bribery, it is a commendable and totally inoffensive form of bribery, for it makes the children happy, eases things for their parents and attracts trade.

A merchant in Tupper Lake, N.Y., offered an excellent assortment of cunning, happy dolls with cheerful faces.

The customer ordering £1 worth of photographs during the three weeks set aside for the campaign received one neatly dressed doll 11 to 14 ins. high. If the purchase amounted to £2 the little girl who accompanied her mother was given a medium-size, neatly dressed doll 17 ins. high. If the little girl succeeded in inducing her mother to spend £5 she was rewarded with one large-size, finely dressed doll 20 ins. high.

Charles Mayer and Co., Indianapolis, Ind., made a certain Friday a red letter day for little girls. On this particular Friday morning every girl in Indianapolis who possessed a doll was invited to bring her doll to the studio There was no distinction between rich girl or poor girl—all had an equal chance—for it was pointed out that it did not matter whether the doll's clothes were torn or faded, or whether the face was chipped or dirty, or the doll big or little, pretty or homely, light or dark, so long as it resembled a doll.

The only rule every little Hoosier girl had to observe was to be sure to pin a piece of paper to the doll with her name and address. On Saturday the dolls were placed in the studio window, and the overflow placed on exhibition in a prominent place inside the studio. Every girl was invited to see the exhibit. On the following Monday a group picture was taken of the dolls. On Tuesday afternoon each girl calling at the studio for the return of her doll was presented with a copy of the doll window picture.

As can be imagined, the stunt got the photographer talked about in thousands of Indianapolis homes solely by the mouth-to-mouth publicity of the children. It got every girl's goodwill, and, aside from getting the parents interested in the studio, it must be remembered that the stunt will do the studio good in years to come, when the little girls are grown up and have little girls of their own.

Evans, Indianapolis, Ind., recently ran a series of flags of our Allies in the local newspapers. Half of each advertisement was devoted to a reproduction of a flag and a brief description of it, and the other half was devoted to the photographer.

In the public schools at the present time most of the history and geography lessons are being devoted to the Allies in the Great War. This has resulted in every school teacher availing herself of all the means in her power to inform her pupils more about our Allies. She pounces upon every opportunity to get home the facts as a cat pounces on a mouse, so the photographer who helps her out in this connection is sure to receive her hearty co-operation. Children hate to have knowledge crammed into their systems, but it is surprising how much knowledge they will pick up if there is an inducement connected with it. This Evans realised in inviting the school children to cut out the advertisements, which appeared every Tuesday and Saturday. The children were then told to colour the flags with crayon or paint and they would soon have a full collection of the flags of the Allies. This stunt might be improved upon by offering prizes for the best coloured flags.

A photographer in Chattanooga, Tenn., knowing how children worship their war idols, offered a photograph, size 15 by 18 ins. of President Wilson or General Pershing with every 10s. order.

It will always pay the photographer to take the child into consideration, for the child will be grown up some day. If a favourable opinion is formed of a photographer while the child is in the impressive age, it will remain long after she is old enough to utilise her own judgment of things.

ERNEST A. DENCH.

FORTHCOMING EXHIBITIONS.

December 20, 1919, to January 24, 1920.—Scottish Photographic Federation. Sec.: John Macdonald, 27, Aberfeldy Street, Dennistoun, Glasgow.

THE SCIENTIFIC AND TECHNICAL GROUP of the Royal Photographic Society will hold its first annual general meeting at 35, Russell Square, on Wednesday, December 17, at 7 p.m. The meeting will be preceded at 6.30 p.m. by an informal gathering of members of the Group in the library, and it is hoped that as many as possible will be present on this occasion. Since the circular setting forth the activities and membership of the Group was published some twenty-five further members of the society have applied for admission, and it is therefore expected that the membership of the Group will reach a total of about 200 early in the new year.

Assistants' Notes.

Notes by assistants suitable for this column will be considered and paid for on the first of the month following publication.

Reducing-out Backgrounds.

In many copies and some commercial subjects it is preferable to remove the detail in the background so as to permit the latter to print black rather than to block out the negative with opaque paint in the usual way. Some years ago I worked out a method of doing this by coating the film side of the negative with collodion and using a very strong iodine solution, applied by means of a brush, as the reducing agent. This was published in the "B.J.," and although it was preferable to scraping the film, especially in the case of negatives for enlarging, it was not an ideal method, and the following procedure will be found to be an improvement upon it.

The negative is first to be thoroughly dried by heat or otherwise, and as soon as it is cool it is coated with collodion just as in the previous method. The coating, however, need not be all over the film so long as the whole of the subject itself is covered. If collodion is not at hand probably almost any other kind of waterproof varnish could be used, but I have not tried any other. When the collodion is dry a little fish-glue (Seccotine) is thinned out with a drop of water, to which a trace of dye or pigment is added. With a sable the edges of the subject are painted over with the mixture in a retouching desk, the colouring matter making it an easy matter to see whether any part has been omitted. Then the plate is laid flat, and the subject filled in with a larger brush so that the whole of the figure to be retained is covered with fish-glue. As soon as this is dry, which may be hastened by warmth, the plate is mopped over with a mixture of equal parts of ether and alcohol to dissolve away the collodion from the background. If another kind of varnish has been employed naturally its appropriate solvent should be applied at this stage. The coating of fish-glue over the subject will act as a resist against the solvent, and so will prevent the varnish underneath it from being dissolved. The latter in its turn acts as a resist against the reducing solution, which is preferably applied with a mop of cotton-wool, as total immersion may find weak spots in the varnish. As soon as the background is reduced out, the plate is rinsed and mopped surface-dry, and the rest of the varnish dissolved. Then a good wash completes the process. In portraits it will be found an improvement to reduce the edges of the subject slightly after removal of the varnish, so as to avoid a cut-out appearance. This may be still further modified by pencil work, as the film is not injured in any way, and may be retouched as usual. —D. Charles.

Finishing Blocked-out Negatives.

Many suggestions have been passed round for covering the portions of the background left uncovered after the outline of a subject has been done with opaque. To cover the whole with opaque is wasteful and not always effective, the paint being liable to abrasion in large areas. A paper mask is the most practical, but a P.O.P. proof nowadays is costly, and a black paper mask not easy to get even an approximately correct shape upon. The following has been found a remarkably quick and easy plan. When the outline band of paint is dry, the negative is laid flat on a table in a good light, and a brush well charged with the paint is drawn round just overlapping the line already made, making it about half-an-inch wide and rounding out any awkward corners. As soon as this is dry again the negative is laid film downwards, this time on a printing box, and a few spots of seccotine put on the glass side in the corners and other convenient positions, but not over the subject itself. These spots are rubbed out thin and smooth with a finger-end till they become tacky, when a sheet of translucent red paper is laid down upon the glass. It is then a matter of an instant to run the point of a sharp knife around the subject, cutting through the paper. The subject can be seen, and the band of opaque gives plenty of latitude, so that there is no particular line to cut to. Thus a correct mask is made in a few seconds, and is already fixed to the negative. A suitable paper is obtainable from Messrs. Butchers.—K.

A Printing-Box Dodge.

About an inch below the plate-glass top of my printing-box is a shelf consisting of a sheet of ground-glass supported on a slat at each side. A slit in the box itself allows "vignettes" or "tissues" to be slid on this shelf at a suitable distance beneath the negative.

Finding it rather difficult to adjust the positions of pieces of tissue paper, for keeping back thin parts of negatives, without frequent lifting of the top of the printing-box, I have hit on the following dodge, which answers splendidly, as well as giving a practical method of damping down the light for weak negatives. Some tracing-cloth was obtained, and pieces were cut the width of the glass shelf and a little more than twice as long. Each piece was folded once, and the two edges opposite the fold pasted together to form a folder closed back and front and open at the sides. A metal ring was attached to each at the same time at one corner by narrow strips of the tracing cloth. One strip passed through the ring, and the ends with plenty of adhesive put between the two pasted edges of the sheet. Then another small pasted strip was passed through the ring, and stuck outside the folder, making, when dry, a quite untearable means of hanging the folders up when not in use.

I find three of these fill all possible requirements for regulating the strength of the light. When a negative needs dodging, it is laid on the box and one of the folders placed on top of it. Then the bits of tissue paper are slipped inside the folder, and when adjusted to the negative the whole is slid as one piece on the glass shelf below, without further trouble.—K.

A Lens-cleaning Hint.

The advice to keep a special piece of chamois leather or old linen for cleaning lenses is excellent, but often is carried out in practice in a manner worse than useless, by the habit of keeping the cleaning material loose in the camera case, or lying about in a drawer or on a shelf where it picks up all sorts of grit. Frequent polishing then results in a beautiful cross-hatching of fine lines over the surface of the soft glass of which a lens may consist.

The method I have adopted is to have a chamois leather bag, and to use the *inside* of this only for wiping lenses. Thus the surface that does the work is always free from dust and dirt. For the benefit of those who work in the West-End of London, I may mention that a woman stands around Covent Garden market selling such bags, presumably as purses, for a few pence each, and these are strung with tape which forms a loop by which the bag hangs on a nail always handy when needed. I have been fortunate in buying a specially smooth white one from her of a softness not met with before.

When a chamois needs washing, it is easy to retain the softness. A thick lather of soap and warm water is used, "Lux" being quick and suitable for the purpose. The leather is rubbed out in the lather, squeezed, and hung up to dry *without rinsing*.—K.

Fixing in Thirty Seconds.—At a meeting of the Royal College of Science Chemical Society on Friday last, November 28, at South Kensington, Mr. K. Hickman gave a lecture on "Photographic Pastimes from the Chemist's Viewpoint."

The lecturer (as reported in the "Times") opened with a demonstration in flashlight photography. A "snap" of the audience was taken, and also a photograph of the chairman. The plates were then given a rapid development with a lightning wash; fixation in a fixing solution, effective in thirty seconds, recently discovered by the lecturer; a further washing for two minutes, in which time the hypo was removed by dilute permanganate; a bath for two minutes in formaline solution, after which the plate was rinsed, dried in a stream of hot air from a machine of the lecturer's design; and finally printed on a lantern plate. Thus, within half an hour of the exposure a lantern slide photograph of the chairman was projected on to the screen.

Later, Mr. Hickman dealt with the screen-plate method of colour photography, which, he said, by its simplicity and the beauty of its productions had ousted all other methods for amateur work. The lecturer screened many examples of slides taken by the Paget process, including flower and scenic studies and portraits.

Exhibitions.

MR. SPEAIGHT'S PHOTOGRAPHS OF SPITSBERGEN.

It would be a very partial appreciation of the photographs now being shown at the Speaight Galleries, 157, New Bond Street, to say that they are a very pleasant collection of examples of Mr. Richard N. Speaight's art in the field of landscape photography. They are certainly that, and so serve usefully to demonstrate that a photographer who has spent the greater part of his life in the study of tone values as they occur in portraiture is able to make excellent use of his self-training when he goes out of doors for his subjects. But the collection, or, perhaps, rather the exhibition of it, possesses more than ordinary interest from the fact of its marking a new kind of enterprise on the part of the West-end photographer. Spitsbergen, for all we know, may be a nice enough place for a holiday trip, but it is as a commercial entrepreneur rather than a holiday-maker that Mr. Speaight offers his photographs for the inspection of the public. The commercial interests which are thus forwarded are those of the Northern Exploration Co., Ltd., the joint-stock undertaking which holds large rights for the getting of coal, asbestos, iron ore, marble and other minerals from the rich deposits on the island of Spitsbergen. The little exhibition serves to bring before a wealthy public the prospects which are offered to the company holding these rights, and does so in the unostentatious semi-detached style of advertisement of which the firm of Messrs. Speaight, Ltd., are past masters. For the rest it can scarcely be said that the photographs realise the glowing epithets applied to the Spitsbergen landscape in a preface to the exhibition catalogue by Dr. R. Cathcart Bruce. For adequate rendering of the "brilliant natural colouring" Mr. Speaight's exhibition should surely have been one of Autochromes or at least photographs from panchromatic negatives. Apparently a Spitsbergen moss-landscape loses a good deal of its natural beauty when rendered in unassisted monochrome.

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Applications November 17 to 22.

Printing Paper.—No. 28,714. Photographic printing paper. Kerotype, Ltd., and T. P. Middleton.

Printing and Transfer Paper.—No. 28,980. Photographic printing paper and transfer processes. Kerotype, Ltd., T. P. Middleton, and T. A. Mills.

X-Ray Photography.—No. 28,566. Manufacture of photographic plates, films, papers, etc., for X-ray photography, etc. J. C. Mottram.

Photographic Apparatus.—No. 28,498. Photographic apparatus. J. P. Hansen.

Cinematography.—No. 29,109. Cinematograph projection apparatus. N. E. Barber.

Cinematography.—No. 29,131. Cinematograph film guiding devices. P. H. Bastie.

Cinematography.—No. 28,440. Cinematograph apparatus. H. Maler.

Cinematography.—No. 29,051.—Cinematograph film joints and process and apparatus for manufacture thereof. J. E. Thornton.

Cinematography.—No. 29,146. Safety shutters for cinematograph projection. W. Willmann.

COMPLETE SPECIFICATIONS ACCEPTED.

These specifications are obtainable, price 6d. each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

Screen Plates for Colour Photography.—No. 129,717 (December 7, 1917). The invention consists in a method of making mosaic colour screen plates of a degree of fineness suitable for cinematograph films. Particulars of the process are given on another page of this issue in the "Colour Photography" Supplement. There are sixteen separate claims made in respect to the invention, all dependent on the first, which is as follows:—Forming a discriminative composite colour-screen suited to determine the production of and control the viewing of a photographic monochrome in the well-known manner on a base which is non-absorbent for aqueous preparations, but is generally absorbent for alcoholic and aromatic preparations, as, for example, a base of simple or compound cellulose ester, by laying on this base colloid lines or areas with a fluid aqueous coloured colloid preparation as described, then, after drying, staining the base by a solution of a dye in a fluid which the base absorbs; the colour of the stain being broadly or generally "antichromatic" to the colour in the aqueous colloid.—Joseph Thomas Smith, St. Peters-upon-Cornhill, London, E.C.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Sunday, December 7.

United Stereoscopic Society. "Passe Partout" Demonstration. W. L. Wright.

Monday, December 8.

South London Photographic Society. "Personal Practice in Lantern Slide Making." J. D. Johnston.
Dewsbury Photographic Society. Members' Lantern Evening.
Willesden Photographic Society. Affiliation Lantern Slides.
Bradford Photographic Society. "The Art of Developing." A. Dordan Pyke.
Bowes Park and District Photographic Society. "Night Photography." A. H. Blake, M.A.
Kidderminster and District Photographic Society. "Some Cotswold Homes and Villages" (Autochromes). W. Partridge.
City of London and Cripplegate Photographic Society. Affiliation Lecture.

Tuesday, December 9.

Royal Photographic Society. "Demonstration of the 'Carbro' Process." H. F. Farmer.
Hackney Photographic Society. "Printing Processes." A. Dordan Pyke.
Chelsea Photographic Society. Discussion of the A.P. and P. Prize Lantern Slides for 1918.
South Glasgow Camera Club. Whist Drive.
Leeds Photographic Society. "Bromoil for Beginners." W. E. Gundill.

Wednesday, December 10.

Croydon Camera Club. "Some Hints on Making, Staining and Finishing Picture Frames." V. Jobling.
Dennistoun Amateur Photographic Association. "The Manufacture of Anastigmat Lenses." A. G. W. Aldis.
South Suburban Photographic Society. "Bruges." G. H. Dannatt.
Photo-Microgrophic Society. "The Use of Light-Filters in Microscopy." J. H. Pledge, F.R.M.S.
Bristol Photographic Club. "The Art of Developing." A. Dordan Pyke.
British and Colonial Camera Club. "Bromide Printing." F. Broad.
Partick Camera Club. W. Fraser Smith and T. MacNeill.

Thursday, December 11.

The Camera Club. "The Home of the Rajput." E. W. Mellor.
Hammersmith (Hampshire House) Photographic Society. "A Few Facts about Fleas." Dr. G. H. Rodman.
Richmond Camera Club. "Improving the Negative." R. H. Lawton.
Brighouse Photographic and Naturalist Society. Demonstrations: "Developing a Negative." H. Robinson; "Developing Gaslight Paper," J. W. Salmons; "Self-Toning Paper," J. R. Broadbent.
Aston Photographic Society. "Flashlight Photography." A. Dicks.
Wimbledon Camera Club. "Control in Bromoil." G. B. Clifton.
Hull Photographic Society. "Finishing Bromide Prints." L. Kirk.
Rodley and District Photographic Society. Yorkshire Photographic Union Lecture. J. B. Seaman.
South Glasgow Camera Club. Ozobrome.

ROYAL PHOTOGRAPHIC SOCIETY.

Meeting held Tuesday, December 2, Mr. W. B. Ferguson, K.C., in the chair.

Mr. A. H. Lisett gave a demonstration of lantern-slide making, in the course of which he very fully described his own practice. The treasurer of the Society is a man of system, whose sense of order is offended by anything which savours of the haphazard. Thus much of the advice which he inculcated was concerned with rules and expedients by which failure due to errors of judgment might be eliminated. He showed how allowance could be made for the various factors affecting exposure in lantern-slide making, such as density and colour of the negatives, and working aperture of lens when making slides by reduction. An important part of

his procedure consisted in notes made of slides produced under previous known conditions. While it may be doubted whether the average maker of lantern-slides can be persuaded to work in an equally systematic way, it must be admitted that from the many results which he showed upon the screen Mr. Lisett could point with ample justification to the exceedingly fine quality of his work.

The Chairman, in dissenting from the recommendation of time development in lantern-slide making, pointed out that while the system was all right for negatives, where it did not matter if density varied, in the case of lantern-slides it was bad practice. He knew of no way of working except by examining the transparency.

CROYDON CAMERA CLUB.

A WELCOME evening for the beginner was afforded last week by the popular president, Mr. John Keane, giving a plain demonstration, "How to Make Bromide Enlargements with the Club Lantern." At first sight this may seem a simple proposition, but the utilisation of the club lantern, which, like a fried mutton chop, is generally regarded by epicureans as the last refuge of the destitute, indicates the president has nerve unimpaired after nearly two years' reign over a turbolent tribe.

Naturally his best friends fondly hoped he would come some sort of a cropper, such as exposing on the wrong side of the paper, or mistaking hypo solution for developer, etc., but the only desirable step in this direction consisted in his forgetting to add the amidol to the sulphite solution, which delayed appreciably the appearance of the image.

It is not necessary to follow Mr. Keane through an admirably delivered elementary exposition, from which good advice flowed in a continual stream. This, of course, kept the demonstrator in the best of spirits, and as it was never seriously at variance with preconceived notions its recipients were equally happy. He invariably employs the "Welborne Piper" formula for an amidol developer. This was stated to be as follows:—Soda sulphite crystals, 2 ozs.; metabisulphite of potash, ½ oz.; water, 10 ozs. For use, take 1 oz. of the stock solution, 2 ozs. water, and 6 grs. of amidol. "Develop to the bitter end," he said, a recommendation which many considered appropriate to the enlargement subsequently produced, technically first-rate and in mildly decorative vein.

As a matter of fact, and it was so pointed out in the discussion, Mr. Piper later modified the original formula by halving the metabisulphite, as being the best proportions for neutralising average samples of sulphite, consequently Mr. Keane was probably employing a distinctly acid solution, which may have accounted for the abnormally long time the print took to develop. He said he had never been let down with his formula, but others narrated contrary experiences, and pointed out that as the addition of the acid salt was primarily intended as a preventive of oxidation, the safest course was to make up fresh sulphite solution each time as generally recommended by the makers of bromide papers.

Mr. Vivian Jobling put in a good word for the hydroquinone-metol developer, which in his hands had kept remarkably well. Mr. E. A. Salt doubted whether any of the modern developers gave better blacks than the old iron developer. Mr. H. P. C. Harpur agreed: the iron developer was more troublesome, and risk of failure was increased, but the intense blacks it rendered had, to say the least, never been beaten.

Towards the end of the demonstration Mr. Keane, who had been doing a lot of plain talking, expanded somewhat. "Well, gentlemen," he declaimed, "after having exposed our bromide paper, developed, fixed, washed and dried the print, what then are we to do?" "Put it in the dustbin," promptly replied a member with deadened artistic soul. The answer sufficed.

It is with great regret that we have to announce the death, at the age of seventy-nine, of Mr. John Noaks, an old and highly esteemed member of the club. Right royally he worked for it in days gone by, and he will be sadly missed by many friends. Exhibition work had little attraction for him, but he was ever a sound photographer, with a good eye for the beautiful. In later years he took up the Autochrome process with enthusiasm, and achieved remarkable success.

Commercial & Legal Intelligence.

THE ILFORD DIVIDEND.—For the year ending October 31 last, the directors of Ilford, Ltd., have recommended a dividend of 8 per cent. on the ordinary shares, against 6 per cent. a year ago.

AT THE LONDON BANKRUPTCY COURT on Wednesday in last week, before Mr. Registrar Hope, the public examination was appointed to be held of Richard Cardwell Barron, photographer, 7, Queen's Street, Bloomsbury, W.C., lately trading at 19, Cheapside, E.C., and lately residing at Shedfield, Ashley Road, Thames Ditton, against whom a receiving order was made on October 14 last, on the petition of a creditor, the act of bankruptcy being the failure of the debtor to comply with the requirements of a bankruptcy notice.

Upon the case being called on for hearing, the Official Receiver stated that debtor had only filed his statement of affairs on the previous day, and the usual summary had not been sent out to all creditors, therefore he asked that the examination might be adjourned in order that he might have time to go into the matter.

The learned Registrar accordingly adjourned the examination until January 21.

Subsequently an official of the Court stated that debtor was in attendance, and was willing to be examined, but the Registrar said that as he had only just filed his statement of affairs it was impossible to go on with the examination that day, because the Official Receiver must have time to investigate the matter.

LEGAL NOTICES.—At an extraordinary general meeting of the Sketch Photo Company, Limited, held at 10, Leigham Terrace, Plymouth, the following resolution was passed, and at a subsequent meeting was duly confirmed: "That the company be wound up voluntarily, and that Mr. E. R. Bowden, certified accountant, 11, Athenæum Terrace, Plymouth, be appointed liquidator." Creditors of the company are required to send on or before December 21 particulars of their claims to Mr. E. R. Bowden, above address.

Notice is given of the dissolution of the partnership between Percie C. Cooper, Algernon M. Cooper, and H. de Horne Cooper, carrying on business as photographers, photo-mechanical printers, etc., Cranfield Works, Cranfield Road, Brockley, under the style of the Cranfield Press, so far as concerns Algernon Morris Cooper, who retires. All debts due to and owing by the late firm will be received and paid respectively by Harry de Horne Cooper and Percie Cyril Cooper, who will continue to carry on the business under the style of Alfred H. Cooper and Sons.

NEW COMPANIES.

RAJAR, LIMITED (private company), was registered on November 24, with a capital of £300,000 in £1 shares. The objects are to take over the business of Rajar, Limited (incorporated in 1907), and to carry on the business of manufacturers of and dealers in photographic materials and apparatus, advertising specialties and novelties, showcards and almanacs, chemicals, etc. The first directors are:—A. E. Parker, Wadhurst, Sussex, paper maker (director of Wiggins, Teape and Company, 1919, Limited, and Rotary Photographic Company, 1917, Limited); T. L. Parker, Withnell Fold, Chorley, Lancs., paper-maker (director of Wiggins, Teape and Company, 1919, Limited); C. F. S. Rothwell, Thornedge, Spring Road, Hale, Ches., chemist (managing director of Rotary Photographic Company, 1917, Limited, and director of Lilywhite, Limited). Registered office: Rajar Works, Town Lane, Mobberley, Ches.

PRESS SERVICES, LIMITED.—This private company was registered on November 25 with a capital of £500 in £1 shares. Objects: To take over the business of a Press and commercial photographic service now or recently carried on by H. F. Baldwin at 47, Fleet Street, E.C., as the "Baldwin Photographic Press Service." The subscribers are:—W. G. Gilbert, 12, Harders Road, Peckham, S.E.15, engineer, 300 shares; R. E. Norman, 21, Marmion Road, North Side, Clapham Common, S.W., press photographer, 100 shares; H. F. Roberts, 54, Ivy Road, Cricklewood, N.W.2, engineer, 100 shares. Permanent directors: W. G. Gilbert, H. F. Roberts, and R. E. Norman (manager and secretary). Qualification, £10. Secretary: R. E. Norman. Registered office: 47, Fleet Street, E.C.

News and Notes.

MESSRS. WALLACE HEATON, LIMITED, 17-19, Change Alley, Sheffield, send us a 40-page illustrated price-list of second-hand apparatus just issued by them. In addition to describing many popular patterns of camera and other photographic apparatus, it contains sections specifying bargains in microscopes and field glasses.

A WAR MEMORIAL BOOKLET showing the part taken by the town of Leiston, Suffolk, in the war has been produced and issued by Mr. J. S. Waddell, The Hayling Studio, Leiston. It briefly details the achievements of Suffolk regiments in France, the local contributions to munition making, and the work carried on in the way of food production and coastal defence in a district which was constantly exposed to the threats of enemy bombardment or invasion. Several large mosaic photographs have as their subjects the many men in Leiston and the surrounding districts who have fallen in the war. The price of the booklet is two shillings.

EXPRESSION OF THE EYES.—Writing to "Camera Craft," a contributor comments upon the strained expression obtained in the eyes by asking a sitter to look, or fix the eyes, on a certain spot. A very much more pleasing expression is obtained by getting the sitter to look at a group of pictures on the wall. Perhaps the eye will roll just a little, but the motion will be so slight as to be unnoticeable. It would appear that the travel of the eyes which is encouraged by the group of pictures results in a slightly wider-open effect, certainly a less strained one, which is most desirable. In addition, the larger number of pictures is more interesting than the single one, and this also conduces to a less constrained look. The writer suggests that those who will take the trouble to make a few comparative exposures by this method alongside that of sliding a picture up and down on a rod will speedily convince themselves of the benefit which it brings as regards a pleasing and natural expression in the eyes.

Correspondence.

**** Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

**** We do not undertake responsibility for the opinions expressed by our correspondents.*

THE ASSISTANT QUESTION.

To the Editors.

Gentlemen,—Of the recent correspondence on the subject of the formation of a union of assistants, the nearest solution seems to be that of the Photographic section of the N.A.U.S.A.W. and C., as put forward by Mr. Harry G. Ward in your issue of the 21st ult.

It seems to me that it fulfils all the suggestions by your correspondent "Another Hopeful," as this society has already headquarters in London and branches in all the principal provincial towns, so that it would be quite easy for assistants out of London to meet together.

We should have the advantage of having a powerful organisation behind us to commence with, and also the help and experience of officials who are men already trained and accustomed to deal in matters affecting questions of labour.

The previous attempts to form a union of assistants have failed chiefly, I honestly believe, owing to the desire of so many to wait and see the other chap make a start, but assistants must shake off this spirit, and each one must get a move on.

I have joined the N.A.U.S.A.W. and C. myself, also induced a colleague to do the same, and hope to persuade several others; and if every assistant would only do likewise, then at last we should be on the road to success.

The future of the assistant depends upon organisation. If the employer can obtain labour for less than a living wage, who can blame the employer?—Yours faithfully, "FORWARD."

To the Editors.

Gentlemen,—Some of your correspondents compare the position of the worker in photography with that of those in other trades; but photography is widely different even from other luxury trades. Before we can hope to improve our position we must at least understand it.

Modern wage increases have little to do with comparative skill. They depend upon the power of closely compacted labour—in mines and factories, for instance—to resist its own dilution, and, further, the power to bring economic pressure on the employer or on the public generally, as in the recent railway strikes.

Presuming that every adult assistant was unionised, could we control the dilution of our own labour? With thousands of scattered businesses up and down the country, each the channel in one way or another of an over-generous flow of boy and girl labour into the trade, the answer is most emphatically No!

As regards economic pressure? It is possible for most of the good old British public to go from the cradle to the grave without worrying a little bit about photography. They have to be coaxed. Any necessitous work could generally be carried through in some fashion by the average employer because he is usually his own principal assistant. Of most of them you can say that they haven't time enough to be managers or money enough to be capitalists. Any necessitous work that the employers couldn't do would be attempted at a cheaper price by hosts of back-garden amateurs. Such, gentlemen, is our ignoble profession. Can and will nothing ever be done? Nothing, until photography is frankly recognised as a sweated, uneconomic trade, and a trade board appointed, as in other similar trades, to improve wages, hours, and conditions, and to settle admission, training, and generally level things up a bit.

The tailoring sweat-shop is a thing of the past; but the type of humanity that used to run them is fast coming into photography, alive to the possibilities of multiple shops, worked at high pressure with a factory behind them. He always opens Sundays. He would open night and day if he thought that there was money in it. The pride and self-respect of the craftsman is nothing to him. It is for reputable photographers, employees and employers alike, to decide whether they will hang together or hang singly.

In "process" work the employers' federation fixes minimum prices. The employees' union has secured a minimum standard wage of £4 7s. 6d. for work that is certainly not more exacting than that of the average photographic assistant. But "process" has the advantage of being associated with the always highly organised printing crafts. It is a compacted trade. Straight photography is not. Much time and effort has been wasted in the past on ambitious photographic union schemes. The one essential thing for the moment is just a trade board. Would assistants be prepared simply to sign a petition for one if forms were circulated?

What is the feeling of assistants of both sexes with regard to action on these lines?

If the "B.J." would oblige by giving this idea publicity, and opinion seems generally favourable, it will be a simple matter for some of us to get together and make a start.—Yours truly,

DIGGER.

NEGATIVE BROMOILS.

To the Editors.

Gentlemen,—A statement by Mr. Clifton in the report of the demonstration he gave at the Croydon Camera Club, as reported in the "Journal" of November 21, to the effect that he had never met with negative Bromoils in pre-war days is quite contrary to my experience.

Up to 1914 I suppose I made some hundred or more Bromoils each year, and certainly found 10 per cent. pigmented up as negatives. The late Mr. Welborne Piper wrote to me on the process when he first discovered it, and this phenomenon had already appeared. He was unable to explain it; we made some tentative experiments, but the pressure of my professional work prevented me following them up, and I think other more important matters absorbed his attention

He generally used ordinary picture postcards for his experimental work, and I, prints made on all the well-known bromide papers, including those mentioned by Mr. Clifton. The negative appearance was met with on all, but we never knew when to expect it. By the way, it was not new to me, as it had occurred also when I worked the Rawlins oil process (see "Oil and Bromoil").

The best remedy is to soak the print in water, clean all the pigment off with petrol or carbona, dry the print, then start *de novo* another day. By continued pigmenting the negative may be converted into a positive, but the result is not so satisfactory as when the former plan is adopted.—Yours faithfully,

Parkstone, Dorset. A. R. F. EVERSHED.

QUANTITY TANK DEVELOPMENT.

To the Editors.

Gentlemen,—May I trespass on your space to reply to Mr. England's criticism of my notes on Tank Development? I was not thinking of the cheapest class of work, but of those middle-class studios where four or even six negatives are made of each sitter and proofs sent of three or four. Working on these lines, Mr. England will find it quite possible to expose 160 plates in a day, although it is admittedly rush work. With regard to retouching and printing, any trade worker will tell you that in the busy season many businesses do put out all this work.

To take Mr. England's second point, I hoped and thought I had made it clear that I was advocating tanks simply for their greater holding capacity, not with a view to time development. Working on these lines, the developer may be absolutely the same as for dish development. For time development, of course, a weaker solution is much better.

Mr. England suggests that assistants should be employed. The trouble is that the rush will not last for more than a few weeks, after which the number of sitters will drop to perhaps three a day. I suppose that the assistants will then have to find other jobs! There are already far too many of these temporary jobs about.

If Mr. England will glance at the last paragraph of my notes he will see that I was not thinking only of one-man businesses. As a matter of fact, it was as an assistant that I experienced this sort of work, and it was my desire to show how the working conditions of such assistants might be improved. Perhaps the choice of a one-man business to illustrate my point was an unfortunate one.

Yours faithfully,

Alton, Hants ARTHUR G. WILLIS.

WAR WORK OF THE EASTMAN RESEARCH LABORATORY.

To the Editors.

Gentlemen,—Your surmise in the issue of October 10 that the smaller number of communications published recently from our research laboratory has been due to the diversion of our activities to war problems is correct in the main. It may interest you to know what the chief war activities of the laboratory were.

The physics department under the charge of Mr. L. A. Jones, who was given a commission as lieutenant in the United States Navy, was devoted to the investigation of marine camouflage, the laboratory research on this subject being conducted at Rochester. Dr. S. E. Sheppard, in the physical chemical laboratory, took up the study of colloidal fuel, and succeeded in preparing a substitute for fuel oil containing 30 per cent of pulverised coal, this fuel showing a very considerable economy as compared with the use of standard fuel oil. The photographic division of the laboratory with the section of photographic physics was devoted to aerial photography, the two main branches of work in this field being the organisation and supply of instructors for the school of aerial photography at Kodak Park, where the ground photographers for the United States Army were trained, and the laboratory investigation of the theory of aerial photography. This latter investigation is now being prepared for publication in the form of a monograph.

In the latter part of 1918 almost all the work of the laboratory was directly connected with military work, and none of its regular work could be carried on. This is not the sole cause for the lessening of publication at the present time, however. When we resumed our work after the Armistice was signed, we found that a great deal of the fundamental research work which had been done had accumulated beyond the possibility of publication in the form of papers. Many of the researches would have required space for publication which no journal could be expected to supply, and it was consequently determined to adopt another form of publication and to prepare a series of monographs dealing with the theory of photography. During the present year these monographs have been started, and three are now well advanced in their preparation, while others have been commenced. While continuing the publication of our work in the form of communications, we hope, therefore, in future to collect work in each special field of photographic theory in this series of monographs, the first members of which will probably be published in the early part of 1920.—Very truly yours,

C. E. K. MEES.

Eastman Kodak Company, Rochester, N.Y.,
November 11, 1919.

MOUNTING BLOCKS TO POINT MEASURES.

To the Editors.

Gentlemen,—May I have a few lines in which to reply to "Bronze Medallist," of the Manchester School of Technology, for the contents of the letter leads one to the supposition that he is very superficially acquainted with the subject, otherwise he would not write so loosely as he does?

Were he a process engraver he should be much more cognisant of the facts and difficulties of the subject than his letter would lead one to believe him to be. Perhaps it is that as our "Bronze Medal" dates back nine years he has not kept himself fully informed on process matters since that date.

He lays it down that the "jobbing printer is more anxious than ever that the . . point system be applied" by the engravers, and states it not merely as an opinion, but as though it were a fact, but he gives no evidence in proof of his assertion.

As a practical process block-maker, I assert that if the fault lies anywhere it lies at the door of the printer himself, because he will not order his blocks by point measurement, especially if such extreme accuracy costs him a veritable fraction more than the lowest price at which he can purchase his blocks without such accuracy.

The excuses your correspondent puts into the mouth of the process engraver are mere nonsense, and his assertion that it is as simple to mount a block to point measurement as to mount it type high is only equalled by his other assertion that this portion of the work is "relegated to unskilled and semi-skilled labour." If he knows anything about the trade at all, after his thirty years' experience, he should know that such a statement will not bear investigation.

I quite agree that the system "would confer a boon," and that the "extra cost would be worth paying for by the printer"; but will he pay it? And will it "bring the block-maker more business for himself"?

Here are a few facts. I am a staunch believer in the point system, and a more staunch believer in sending out blocks perfectly true in every way, so at great expense to my firm I launched a campaign on the printing trade. I sent several communications to practically every printer of any repute in this country offering them their plates mounted on a patent mount, *guaranteed* true to point measurement and type high, dead true in every way, and all this *guaranteed*. But, alas, to receive this cost the printers one halfpenny per square inch more than the usual cost of his blocks. What was the result—absolute failure, for out of the less than 100 replies we received (from printers only, remember) about 80 or 90 per cent. persisted in ordering by inch measurements, and some 60 or 70 per cent. thought the ½d. per square inch too great a price to pay for the accuracy. So after many months' struggle to introduce point measurement and dead accurate work we gave it up as a bad business, and to-day our experience is that not one-tenth of 1 per cent. of the orders that come to us from printers are ordered by points instead of inches.

If your correspondent considers it "time the block-makers got a move on," and that it seems a simple matter to devise means whereby blocks can be turned out dead true to point measures "automatically as easily as the present system," let him by all means get to work and show us how. I for one will give his system a hearty welcome, even though it might turn out that theory and practice did not agree.—Yours truly,

TH. EAMER,
Managing Director of the Marshall Engraving Co.

Answers to Correspondents.

SPECIAL NOTICE.

In accordance with our present practice a smaller space will be allotted to replies to correspondents.

We will answer by post if stamped and addressed envelope is enclosed for reply: 5-cent International Coupon, from readers abroad.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

T. W.—You require a licence, the office for which is at Queen's College, Paradise Street, Birmingham. There is no charge for the licence, and it holds goods as long as the Licensing Order remains in force.

G. T.—Apart from the copper toning process, which is not now in much favour, the only formula we know is that of sulphide-toning in the usual way, and then toning the sulphide-toned prints in a gold sulphocyanide bath as used for P.O.P.

N. AND Co.—The two firms for enamels are Mr. J. W. Beaufort, The Studio, Easy Row, Birmingham, and Farquhar Vitrified Enamels Co., Derby Lodge, East Sheen. There is no other form of photograph which could be used with the certainty of it withstanding prolonged exposure to weather.

C. R.—The office of the Retail Businesses (Licensing) Order to which you should apply is at Queen's College, Paradise Street, Birmingham. We do not think you can be restrained from canvassing outside your own town so long as the business proper is carried on at the address in respect of which the licence is issued.

W. N.—Dissolving views are almost completely out of favour with the general public. You had very much better spend the money on the best equipment in the way of light for a single lamp. We assume, of course, that you are intending to show ordinary photographic slides, not dissolving-view effects such as had some popularity twenty or thirty years ago, but now, except for children's entertainments, are utterly out of date.

G. H.—The chief consideration is not the size but the design of the burner—that is, the proper adjustment of the gas passages and air inlet. By far the best burner that we know of is the inverted "Howellite," which Messrs. Griffins supply. Your lens is all right, supposing that it has a focal length of at least 8 ins.; all the better if 9 ins. With this lens and a good incandescent light you ought to be able to enlarge 5 to 6 diameters without exposures becoming inconveniently long.

C. E. G.—We are quite at a loss to account for the stains on the enlargement from the particulars you give. If we had nothing whatever to go upon, we should have said that the enlargement had been wilfully dabbed over with some bleaching solution, such as ferricyanide and bromide, as used for sepia toning. The paper appears to be one by a leading maker, and therefore we think it is a matter which might reasonably be referred to the makers, so we return the enlargement.

E. K.—There is no means that we know of taking out the stains. If it is a very light-coloured fabric, some benefit no doubt could be made by rubbing the stains with a little paste made of bleaching powder (chloride of lime) to which a very little hydrochloric acid has been added—enough to give the mixture a chlorous smell. This will attack developer stain, but, unfortunately, also the dye used for most dark fabrics. If it is a dark suit, about the best thing you can do is to make the stains less conspicuous with ordinary ink.

M. B.—1. You tell us so little about the stains that we can only guess at the cause. If they occur with large numbers of prints, and all in places near to the edges of the cards, it is just possible that they may be due to a defect of manufacture, although we have never seen anything of this kind. Still, failing this explanation, we can only suggest that they are due to some chemical contamination such as hypo or sulphide before or during development. 2. You can get a cement for sticking celluloid to negatives from Messrs. Rheinlander, New Malden, Surrey.

W. E.—Very likely painting with quinine has been mentioned by various people from time to time, but it is a relic of the wet-collodion days. No doubt the process you suggest would work if wet-collodion plates were the only sensitive material available. But it does not do with dry-plates, which in the ordinary way show no sign of the invisible quinine markings. We know of no secret writing which can be done so as to defeat the copyist. We are afraid the only course of this kind which you can take in self-protection is to deface the prints with ink, say from a rubber stamp, or by perforating them with your trade name, as is commonly done by photographers when sending out proofs.

C. L.—1. Prices range from £3 to £10, according to lens. 2. We have not a price list of the plates and brooches. You should apply to Fallowfields, 146, Charing Cross Road, W.C.2, or to Messrs. Moore and Co., 103, Dale Street, Liverpool, who are makers of the cameras. 3. Yes; developed and fixed at one operation. 4. Rinsing in water for three or four minutes. 5. As a rule, not more than about $f/8$. 6. Yes, most of the cameras are of fixed-focus type. 7. If you have been in the photographic business at your present address prior to February, 1918, it would not be necessary to obtain a licence. If your business has been established since that date, you presumably have obtained a licence, the office for which is Harewood Barracks, Leeds. The only other permit that may be necessary is one from the police. Police authorities in different districts differ considerably in asking for this.

H. B.—Unless you are working from negatives which have a lot of retouching on them, by far the best electric enlarging light is a small arc lamp such as that of the Westminster Engineering Co., Victoria Road, Willesden Junction, N.W. However, the arrangement of diffused light which you suggest is quite practicable, and is in fact used to a fair extent by professional photographers, as it is better for retouched negatives and also for those which may be of rather weak density. You should use opal as the diffuser; ground glass is not sufficient. As regards the lamps, you want high power, say, 500 to 600 c.p. at least, and at the same time you want the filaments of the lamps parallel with your diffusing screen. Unfortunately, most of the half-watt lamps are made with the filament horizontal when the lamp is in the right position for burning, an arrangement which suits a vertical enlarger all right, but is a waste of light when the diffusing screen is vertical. Therefore, unless you can get half-watts with the filaments in the vertical position, your best plan is to choose from the ordinary metal-filament lamps of high power. There is nothing much in a parabolic reflector. You will do just as well with a curved or even a flat reflector of white Bristol board.

The British Journal of Photography.

The Oldest Photographic Journal in the World.

PUBLISHED EVERY FRIDAY. ESTABLISHED 1854. **PRICE TWOPENCE**

TERMS OF SUBSCRIPTION, POST FREE.

UNITED KINGDOM.—One Year, 10s. 10d.; Six Months, 5s. 5d. Three Months, 2s. 9d.

CANADA ... ...
AUSTRALIA ... ...
NEW ZEALAND ... ...
SOUTH AFRICA ... ...
UNITED STATES OF AMERICA
SOUTH AMERICA ... ...
INDIA AND FAR EAST ... ...
CONTINENT OF EUROPE ...

One Year. Thirteen shillings (13s.), or 3 dollars 17 cents, or 22 francs, or 9 rupees 12 annas, or 6 yens 30 sens.

FEDERATED MALAY STATES, BORNEO AND SARAWAK 5 dollars 57 cents.

HENRY GREENWOOD & CO., LTD., Proprietors and Publishers, 24, Wellington Street, London, W.C.2.

IMPORTANT NOTICE TO READERS.—Until further notice agents will supply the "B. J." to order only, as the high price prevailing for everything in connection with newspaper production prohibit the distribution of surplus copies for chance sales. It is therefore necessary in order to ensure the regular delivery of the "B. J." each week to place an order definitely with a dealer, newsagent or bookstall clerk, or to send a subscription to the publishers.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3110. Vol. LXVI. FRIDAY, DECEMBER 12, 1919. Price Twopence.

Contents.

	Page
Ex Cathedra	717
Some Matters of Etiquette	719
Improvements in Optical and Enlarging Lanterns. By Ankcteil Henderson	720
Intensification and Reduction with Pyro Developers. By R. B. Wilsey	721
Forthcoming Exhibition	723
Practices in the Studio. By Practicus	724
Lens-Separation in Stereoscopic Photography of Small Objects on the Same or an Enlarged Scale	725
British Photographic Manufacturers' Association, Ltd.	726
Death of Mr. H. V. Hopwood	726
Assistants' Notes	726
Photo-Mechanical Notes	727
Patent News	727
New Materials, etc.	728
Meetings of Societies	729
News and Notes	730
Commercial and Legal Intelligence	731
Correspondence— The Development of Lantern Slides	731
Answers to Correspondents	731

The Summary of contents which usually occupies the lower half of this column will be found at the foot of the page overleaf and will be placed there whenever its regular position is required for notices relating to the forthcoming "B.J. Almanac."

The 1920 Almanac.

The fifty-ninth annual issue of the "British Journal Almanac" is now printing, and, barring unforeseen circumstances, will be on sale during the first day or two of February next. The time may seem long, but the "Almanac" is a big book, and, moreover, it still seems impossible to obtain productive work such as printing, and particularly binding, within a space of time as short as that in pre-war days.

The "Almanac" will be issued in its pre-war edition of 25,000 copies—apparently none too many for the great demand for it in all parts of the world. It will be issued at 1s. 6d. net, in paper covers; 2s. 6d. net, cloth bound. This early opportunity is taken of suggesting to those who desire to make certain of obtaining a copy that an order should be placed forthwith with a photographic dealer, bookseller, or railway bookstall.

One feature of the forthcoming book is a lengthy editorial article on "Beginners' Failures in Photography." The many practical hints contained in these pages are arranged upon a utility plan which makes it the easiest matter for the photographic tyro to discover the cause of a defect in negative-making and printing, and to learn the remedy or preventive. Although written primarily for the less-experienced photographic worker, it will probably be found that these notes are not without interest to those who can claim a considerable knowledge of photographic processes.

Practical progress in photography obtains its customary survey in the "Epitome of Progress," which will once again be an important section of the "Almanac." Other sections, such as those of Formulæ and Tables for everyday use, have been revised, and, wherever judged advisable, restored to the full length and scope to which users of the "Almanac" were accustomed in pre-war issues.

EX CATHEDRA.

Foggy Days. The weather during the past few weeks has been quite seasonable, or, in Air Force parlance, "visibility is low." To photographers this means that the light is poor and that flat negatives are the order of the day. However, there are few studios now that are not provided with electric light, so that exposures are always possible, but there is so far no means of clearing the atmosphere, despite the promises of experts to precipitate the suspended carbon by electric discharges. There are fortunately some ways of mitigating the trouble caused by fog in the studio, which photographers should not overlook. One is the employment of as short-focus a lens as can be used without causing noticeably bad drawing, so that as little atmosphere as possible intervenes between lens and sitter. Another is to screen off all light which is not actually falling upon the sitter. If two exposures be made, the same sized image being obtained in each case, one with a 16-in. lens and the other with a 10-in., it will be found that the latter is appreciably more brilliant, and a further improvement can be made by building a sort of tunnel with backgrounds or screens so that the camera end of the studio is in shadow. Full development should be given so as to secure as much contrast as possible, and although the negatives may look rather muddy, they will yield fairly bright prints.

* * *

Quartz Lenses. Any practical suggestion from so experienced and judicious a photographer as Dr. D'Arcy Power, of San Francisco, commands respectful attention. Therefore, when Dr. Power reports, in the current issue of "Camera Craft," on inexpensive $f/4$ lenses, we do not dismiss his remarks as prompted by insufficient information or undue enthusiasm. Dr. Power had made for him, at the cost of 5 dollars, by the Hanovia Chemical and Manufacturing Co., of Newark, New Jersey, a 4½-in. $f/4$ lens of quartz or rock crystal, the performance of which in landscape or portraiture he shows in some very fine reproductions. The lens, which is of the single meniscus type, does not give critically sharp definition at full aperture, or, indeed, when moderately stopped down. It yields, on the contrary, an image of very moderate and pleasing "soft-focus," the diffusion being just about of the degree which is now widely popular in professional portraiture. But, unlike partly corrected spectacle lenses, such as have been used by M. Puyo and others, it works almost to focus, whilst, in comparison with objectives of more complex construction, its rapidity is, no doubt, greater than is commonly indicated by the f number. There seems no good reason why a lens of this kind should not serve admirably for portraiture as well as for pictorial landscape. If a single 4½-in. instrument can be specially

made for about £1, the cost in the regular way of manufacture should be of the order of one-quarter that of the Petzval or an anastigmat type.

* * *

Real Window Dressing. A Manchester photographer, so we read, in a newspaper report reprinted on another page, has surely achieved a record in providing an attractive display in his window. He there showed a live pony and donkey, which are used as accessories in the studio by sitters desirous of being photographed as highwaymen or Wild West cowboys. It is not intimated to us in which of these characters the sitter is mounted on the donkey; but, however that may be, the success of the idea can have no better testimony than the fact that the crowd around the photographer's window obstructed the ordinary traffic of the street, so that the police ordered the proprietor to withdraw the animals from public view. Apart from the novelty of the style of portraits, the photographer seems to have realised the truth of a favourite dictum of the late Augustus Harris's when manager of Drury Lane Theatre, to the effect that the public will always come in its crowds to see inside a building what they can see for nothing outside. The incident arouses another thought. If it is true that what Manchester thinks to-day, England thinks to-morrow, we must apparently prepare ourselves for surprising displays in photographers' shop-windows.

* * *

Artificial Lighting. Those photographers who are unable to obtain electric current have practically no choice except between incandescent gas and the magnesium flash. Both these have their own particular disadvantages, the former that of excessive heat, and the latter the difficulty of keeping the studio clear of smoke. In many cases, either of these defects can be removed by the simple expedient of placing the light outside the studio windows and working as if using daylight. The only modification necessary, except a box or cover to protect from the weather, would be a hinged or sliding panel to allow the light to be adjusted. The use of magnesium ribbon is, in our opinion, not sufficiently appreciated by photographers, as its steady light can be tolerated by many sitters who are disturbed by the sudden flash. Moreover, there is no danger of explosion, and the ribbon can be kept indefinitely without deterioration. If necessary, the ribbon can be burned in a comparatively small box with a glass or fabric front inside the studio, and the smoke allowed to condense between the exposures.

Vignettes. In one form or another the vignette picture is always in fashion, but unfortunately the vignetting is not always done in a skilful way, which is perhaps not to be wondered at when it is recollected that nearly all work is now done on development papers, and that there is no opportunity of correcting errors as the printing proceeds. One great help to successful results is to be found in the camera-vignetters, which allow of a vignetted image on a background of any tint, light or dark being obtained by straightforward "solid" printing. A hint which may be useful to those who find a difficulty in getting the lower part of the margin uniform in depth with the upper is to look at the image on the screen at as great a distance as the focussing cloth or canopy will allow. When vignetting with ordinary negatives in a printing box it is sometimes difficult to decide how far any given opening will spread over the image. This can easily be seen by placing a *thin* piece of ordinary white paper, not oiled or waxed, on the negative as if a print were being made. The illuminated portion and the degree of softening at the edges are then plainly visible and the vignetting card can be moved until the desired effect is obtained.

* * *

Names on Mounts. In the by-gone days, when gold bevel-edged mounts were universally used, it was the usual thing for the photographer to utilise them for advertising purposes to the limit of their capacity. Not only was the name and address printed or embossed upon the front, but the back was usually filled with such information, including reproductions of medals, Royal coats-of-arms, etc., as the photographer thought would be interesting to his patrons, or, perhaps more likely, beneficial to his business. Now the pendulum has swung the other way, and we have a plain piece of paper bearing on the front a pencilled signature, or even a monogram or a cartouche, with some more or less cryptic sign. Except in the case of very eminent artists, there are certain disadvantages attached to this practice, as a recent experience showed. A visitor called upon us with a photograph of a deceased relative mounted in the modern way with a more or less illegible monogram beneath it. Fortunately, we were able to identify it, with the result that the photographer received an order, otherwise the portrait would have been sent to another photographer to be copied. Some years ago Mr. Essenhigh Corke suggested attaching a very small label with the artist's name and address to the back of the mount, and this, we think, is a sensible practice.

SUMMARY.

An Australian contributor, Mr. Anketell Henderson, sends us a description of certain very interesting improvements in optical and enlarging lanterns. These consist chiefly in provision for the use of lenses of different focal length and in means for automatically adjusting the position of the light-source appropriately to the focal length of lens which is being used. (P. 720.)

The separation of the lenses in stereoscopic photography of small objects on the same or an enlarged scale is the subject of a short contribution by Mr. Charles E. Benham, in which a working rule and formula are offered for discussion. (P. 725.)

In a leading article we appeal to photographers to take a firm stand against the making and issuing of photographs which are offensive to good taste. We urge also that firms of all descriptions in the photographic trade should discountenance the practice, which appears to be widespread among those ordering portraits, of getting unfinished proofs copied at a cheap rate as a substitute for purchasing the finished prints. (P. 719.)

We regret to have to announce the sudden death of Mr. H. V. Hopwood, a librarian in the Patent Office and well known also for his work on the history of cinematography. (P. 726.)

A new field in the intensification and reduction of negatives is opened up by the experiments set forth in a communication from the Eastern Research Laboratory, according to which the pyro developer may be used as either an intensifier or a reducer. (P. 721.)

In his article this week "Practicus" deals with the making of natural poses of the figure in studio portraiture, and has a number of hints to give on such matters as the arrangement of the hands and the use of the camera. (P. 724.)

At the Royal Photographic Society on Tuesday evening last Mr. H. F. Farmer gave a most successful demonstration of the improved version of Mr. Manly's Ozobrome process which he has entitled "Carbro." (P. 729.)

Mr. Clement Shorter has written to the "Times" pointing out that he was the first to produce an illustrated newspaper consisting entirely of half-tone reproduction. (P. 727.)

A colour-sensitising formula for use in a system of two-colour photography is the subject of a recent patent. (P. 728.)

An inexpensive single lens of $f/4$ aperture is favourably spoken of by Dr. D'Arcy Power. (P. 717.)

A Manchester photographer has secured prominent advertisement by displaying a live donkey and pony in his shop window. The animals are used for portraits of sitters in the rôle of "highwaymen and Wild-West cowboys." (P. 718.)

Foolish Competition. The high price of photographic materials has had one salutary effect on the prices of portraiture, inasmuch as it has justified making more remunerative charges than were in vogue in the cheaper classes of business when competition between manufacturers enabled photographers to cut prices to a dangerously low level. Before the price of materials falls to any considerable extent it would be well if photographers, outside the Cheap Jack class, could come to some agreement as to a minimum price for the cheaper grades of work, such as postcards and the so-called cabinet panels. Not very long ago many businesses were only made to pay by employing sweated juvenile labour and using the cheapest materials. In one case which came under our notice the highest paid employee in a business offered for sale was the receptionist at 10s. per week: the bulk of the work was done by apprentices (!) and ex-apprentices at salaries varying from 2s. 6d. to 8s. weekly. Such methods are scandalous, and we trust that photographers will be able to get together and make them impossible in the future.

SOME MATTERS OF ETIQUETTE.

There are one or two matters which have come greatly to our notice of late, and call for the serious consideration of photographers in a professional rather than in a commercial spirit. Maxims of etiquette are, we fear, not so widely observed as they should be, however much may be said by photographers in the way of claiming professional status. Yet, inasmuch as the war, by bringing heads of frankly commercial undertakings more closely together, has done much to establish a more definite code of ethics in many trades, we may reasonably look for signs of a wider appreciation of the same idea among photographers. It is in this spirit that our notes call for consideration.

The first matter is the making of photographs which, by reason of their objectionable character, are offensive to good taste. It is difficult always to draw a sharp line between what is indecent and what is not, but it can, at any rate, be said that photographs to which some photographers do not hesitate to put their names come very near to this line. We have had several examples of them shown to us within the last few weeks, and have been astounded that any man who sought to maintain the impression that he carried on a reputable or even a respectable business should allow his name to appear on them. The theatrical profession, which of late has permitted itself, and is permitted, a larger measure of licence than formerly, has, perhaps, something to do with this tendency. But a photographer must be very short-sighted indeed if he thinks that a presentation which may be permitted in a stage scene, where perhaps it lasts for only a few minutes, is without offence when it is embodied in the form of a photograph taken under altogether different conditions. Photographers as a whole should not be deterred by any fear of being dubbed Puritanical in doing everything they can to discourage the making and issuing of photographs of this character. The practice did great harm to photography as a whole a generation ago, and it will do the same again unless photographers, who may be quite certain they have public opinion with them, will leave no stone unturned by way of dissociating themselves from it. Usually, the means of doing so is readily found: where photographs or postcards of an objectionable character are offered for sale, the local authorities will almost always take action in respect to them on their notice being drawn to the matter Photographers owe it to themselves that they should be the people to be the first to do this. We had an instance only quite recently of a very objectionable photograph being circulated under his own name by a photographer in a seaside resort. On a photographer, into whose hands one of the photographs came, bringing it to the notice of the Corporation, he received official thanks for his action in the matter. Probably cases of this kind are most frequently to be found in the more popular coastal pleasure resorts, the local authorities of which certainly have an interest in correcting the impression which such photographs give.

The other matter to which we wish to refer is the copying of unfinished proofs which are sent to a sitter. We have good reason for saying that this practice is now of much larger dimensions than perhaps any individual photographer imagines. A sitter is sent, perhaps, half-a-dozen proofs in the form of untoned P.O.P. prints or rough proofs on a development paper. Although the photographer may specifically ask for the return of all the proofs with the order, or may even make their return a condition of the transaction, there is still the opportunity between getting and returning the proofs for the sitter to have them copied. The legal right of the sitter to do so is somewhat obscure. So far as copyright is concerned, it was definitely held by a court years ago that copyright in all the photographs taken at a sitting became the property of the sitter, even though he or she ordered photographs from only one or two of the negatives. As regards the position in common law, we cannot recollect that a judgment deciding an issue of this kind one way or the other has ever been given, but it is perfectly obvious that a sitter who sends such proofs to be copied thereby supplies the photographer with the best possible evidence (if it could be ascertained) that the work is considered satisfactory, and that therefore the sitter is liable for such charges as a photographer makes for sittings only—that is to say, in respect to the making of the negatives from which no photographs are ordered. Unfortunately, it is probable that in most cases a photographer is not able to find out that his proofs have been copied. In some cases such work is offered to other photographers, the majority of whom, we are glad to think, unhesitatingly refuse it, and refer the customer to the studio at which the negatives were made. On the other hand, there are the cheap copying firms, many of whom, apparently, have no such scruples, whilst in these days many people can find some amateur photographer among their friends, and can get the copies made by him, without perhaps allowing him to realise the very shabby treatment of the photographer who took the negatives which his assistance makes possible. We draw attention to this matter because, no doubt, there are still some photographers who do not sufficiently regard this copying of proofs as a flagrant breach of etiquette. We think, also, that work of this kind should be declined without exception by firms undertaking the ordinary work of printing and enlarging. We know that it is the custom of the largest photographic firm in the country to return all such orders to the customer, whether the latter be the individual owner of the proofs or a dealer into whose hands they may have been placed. Such action is dictated by a correct idea of what is common fairness, and we hope that individuals and firms undertaking trade work will set their faces against these paltry attempts to deprive the photographer of business which is legitimately his. We are here referring only to proofs which are submitted for approval. The same arguments do not apply to finished portraits, which obviously are the customer's own to do what he likes with. Whatever may be thought of the wisdom of having cheap copies made of them, there is no ground for calling it by an ugly name. What we have said is also a reminder to photographers that they themselves should not omit measures, such as defacing proofs with a perforating stamp, which will do a good deal, though not all that is necessary, to prohibit this illegitimate copying.

IMPROVEMENTS IN OPTICAL AND ENLARGING LANTERNS.

For over forty years the writer has used, when lecturing, a projection lantern with two lenses, one about 7-in. and the other 1½-in. focus, and by having a slotted frame for the slide carrier near the lenses and reversing a nose-piece carrying the lenses, he has been enabled with the 1½-in. lens to project portions of the slide at increased magnification, often, in the case of buildings, nearly up to full size. By using the lantern slide in a special carrier and covering with velvet the inside faces of the slotted frame, the carrier and slide would remain stationary, and any portion of the slide could be examined in detail, focussing being effected by an arrangement like a focussing jacket. The writer will never forget the cries of delight from the audience when he first used this arrangement, showing the porch details of Amiens Cathedral about one-third full size on a big screen.

For many years the 1½-in. lens was used with this lantern for enlarging special portions of negatives, both portraits and buildings.

Fig. 1 is a sketch of this projection lantern, which is an invaluable instrument to anyone lecturing on technical subjects. As the position of the light had to be a little nearer to

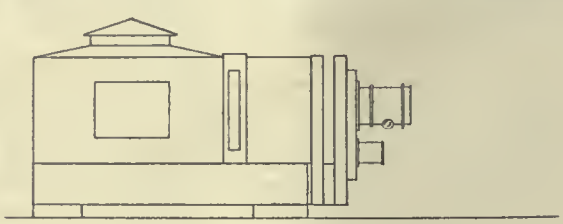


Fig. 1.

the back for the illumination of the 1½-in. lens, a stop for each position of the light was provided in the lantern base, and the change could instantly be effected by a pull or a push. So far as the writer knows, no similar instrument has ever been described.

About eight years ago this principle was applied to an enlarging lantern, the bellows being removed and a series of slotted frames substituted to hold the negative-carrier at different distances from the condenser, and so allow shorter focus lenses to be used: with the 1½-in. lens before mentioned, nearly full-size heads could be obtained from large group negatives. Further, vest-pocket negatives could be placed in the slot at a bright portion of the cone of light away from the condensers, and with a 3-in. lens enlargements made in half the time.

A further improvement was made this year. The bellows of the enlarger was not removed but cut in two halves, and an extra and movable slotted frame for the negative-holder was provided. This was carried by two brass tubes fitted with racks and passing through the usual fixed slotted frame, and actuated to slide to any position by a pinion at the back of this frame This extra frame was made of sheet brass with square holes, and stiffened by angle-edges, into which the bellows folded when contracted. In a new enlarger the extra slotted frame could be carried by an upper slide in the enlarger base, the lens board being carried by a lower slide, this being cheaper than brass rod and double racks, etc.

This improvement in the enlarger has given the writer so much pleasure that he hopes others and manufacturers will adopt it. Bits out of old negatives often give charming pictures, and faces out of groups, especially children, have given a new interest to photography.

Fig. 2 is a sketch of the new enlarging lantern, which is shown with parallel bellows. It works with tapered bellows if the taper is not too great. The thinner the material for the bellows, the greater the range of effects.

As to lenses, the writer generally uses three—1½ ins., 3 ins., and 6 ins. Each lens is fitted with a lens board, and it takes about half a minute to change from the 6-in. lens, giving nearly

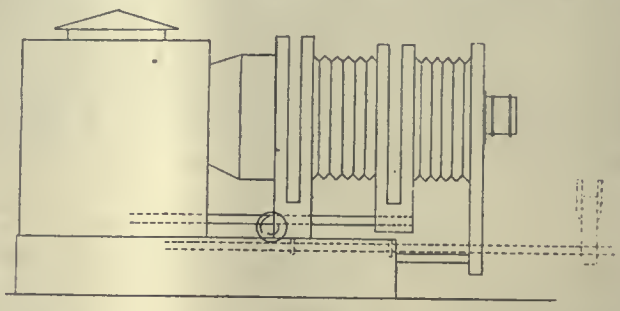


Fig. 2.

five diameters, to the 1½-in., giving about sixteen diameters. The 1½-in. was a "Pistolgraph" lens made by Dallmeyer, aperture $f/2$, for which the writer gave its weight in gold about forty-three years ago. Dallmeyer's Cameo lens, about 2 ins., has been used by one of his friends. Good cinema lenses of 2-in. focus can often be picked up. For vest-pocket negatives the writer uses an Aldis 3-in., with excellent results. A slight alteration of the lens board would allow the V.P. camera itself to be used for projection if the lens were a doublet.

When diffusion is required in the enlargement, many use a cap on the lens, perforated and covered with chiffon, but this gives no latitude. By inserting a frame covered with chiffon in the central slotted frame and racking backwards and forwards, diffusion can be varied at will from a bare diffusion to a great one. By using a frame of white chiffon a wonderful softening of a hard negative can be produced.

The writer experimented with an enlarger with two moving intermediate slotted frames, so as to be able to use chiffon when enlarging with shorter-focus lenses, but found the two awkward to handle in a darkroom, and does not recommend more than one.

Another convenience of the new arrangement is the use of a vignetter in the intermediate slotted frame, as, by racking backwards and forwards, the vignette is enlarged or contracted at will.

The writer's vignetter consists of a wooden frame to fit the slot and open at the top. The vignetter hangs by hooks from the top bar of a wire frame sliding in grooves in the wooden frame, and the wire frame may have a rack actuated by a pinion to raise and lower it. The vignetter consists of a metal plate with a large opening in the centre. The edges of the plate are folded over to form a frame to carry the vignetting card suitably perforated to the shape required. The bottom of the plate is weighted with lead or other metal, and as it swings backwards and forwards on the top wire of the inner frame it gives the necessary softening of the vignette on the easel.

Fig. 3 gives an isometric sketch of the vignetter.

To use the vignetter, or diffuser, when the intermediate slotted frame is in use the writer uses a cantilever frame to carry the vignetter or diffuser. This consists of two brass tubes united by a bar of wood in front, the back of the tubes

passing through eyes screwed into the base of the enlarger. This cantilever is shown dotted in fig. 2, the top of the front bar being level with the bottoms of the fixed and moving slotted frames.

One of the adjustments liable to be forgotten when enlarging is the focussing of the light after the negative is focussed. It

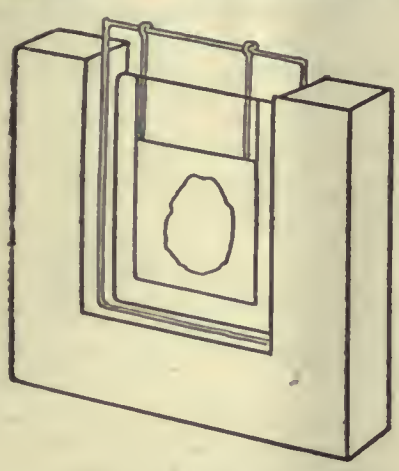


Fig. 3.

involves the taking out of the negative holder and replacing it, and sometimes recentring of the negative.

The writer first experimented with levers of various shapes to focus the light automatically, and about ten years ago adopted a simple straight lever—even for the smallest size of incandescent burner he finds the straight lever efficient for focussing the light. A strip of brass, a few screws, and some stout brass wire are all that is required in most cases, and the following simple operations all that are necessary.

First focus the negative and then the light for an enlargement of $1\frac{1}{2}$ in. diameter, say from a quarter to half-plate, and mark the position of the light-tray and the lens carrier respectively. Second, focus the negative and then the light for an enlargement of, say, four diameters, and mark the new positions of light-tray and lens-carrier. Both will be found to have moved an inch or more, and both in the same direction. With a 6-in. lens the movement will be about $2\frac{1}{2}$ ins., and with the usual condenser the movement of the light-tray will be something less. Let us assume $1\frac{1}{2}$ in. To ensure proper focussing of the light we must connect lens to light by a lever to move in these proportions. The author has found that a lever about three times the length of the largest of these dimensions to be a good proportion. Multiplying $2\frac{1}{2}$ and $1\frac{1}{2}$ by 3 gives $7\frac{1}{2}$ and $4\frac{1}{2}$. Take a strip of brass about $8\frac{1}{2}$ in. × $\frac{5}{8}$ in. × $\frac{1}{16}$ in., and drill two holes, A and B (fig. 4) $7\frac{1}{2}$ ins. apart, and with a screw through end A pivot the lever to the base of the lantern (under the condenser is preferable) and connect the other end B by a stout wire to the lens board. At $4\frac{1}{2}$ ins.

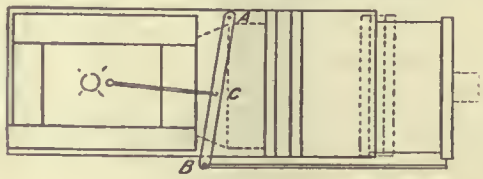


Fig. 4.

from the pivot end drill a smaller hole C and connect by wire to the light-tray. The light-tray should be made to slide easily. The wire connection may be made under the lamp box or inside the lamp box, as most convenient, and it is advisable to use in the measurings the longest focus lens you use, about 6 ins. for a $\frac{1}{4}$-plate.

When this is completed we shall have an optical system in which the light is always in proper focus for the projecting lens in any position it may be required, and any shorter focus lens may be substituted for the usual projecting lens, if provision be made for the negative carrier at a suitable distance for the lens, as can be done with the improved enlarging lantern just described.

ANKETELL HENDERSON.

INTENSIFICATION AND REDUCTION WITH PYRO DEVELOPERS.

A Communication from the Research Laboratory of the Eastman Kodak Company.

In the course of a study of the colour of photographic negatives developed in pyrogallol developers, it was suggested by Mr. L. A. Jones, of this laboratory, that the alteration of this colour might be utilised as a method of photographic reduction or intensification. It is a matter of common experience among photographers that a pyro-developed negative has a greater printing density and contrast than a neutral negative of equal visual density and contrast. The strength of the pyro colour can be varied over a wide range by suitably altering the concentrations of constituents of the developers, especially that of the sulphite. A pyro developer without sulphite gives an extremely yellow negative, while sufficient sulphite can be added to the developer to produce a negative with no visible yellow colour.

Several methods of photographic intensification involve bleaching the negative and subsequent re-development in a solution which gives it a greater photographic contrast. By re-developing in a pyro formula the amount of intensification or reduction can, within certain limits, be controlled at will by varying the sulphite concentration of the developer. Where the greatest reduction is desired, re-development in some such developer as Elon gives lower photographic contrast than any pyro formula.

For bleaching the negative, there are two possibilities: a ferricyanide bleach leaves pyro stain in the negative, while a permanganate bleach removes the stain. Thus, the pyro colour may be left in the negative, and more colour added by re-developing in pyro; or the colour can be removed and a different amount of colour substituted by re-developing in the proper formula.

The present experiments were made to determine the possibilities of this method, and to measure the amounts of intensification or reduction obtained under various conditions. Any intensification or reduction by this method consists in altering the colour of the photographic deposit; little change is produced in the visual density values of the negative; therefore, the amount of intensification or reduction must be determined by printing upon some positive material. The printing medium used in those experiments was positive motion-picture film. The negatives to be intensified or reduced were all made on Seed 30 plates.

The procedure was as follows: A 10 x 8 plate was exposed

in the sensitometer to 22 steps, in which the exposures increased by successive powers of $\sqrt{2}$. The areas having equal density were about ⅜ in. wide and extended across the short dimension of the plate. This plate was developed, fixed in plain hypo, washed, and dried. It was then cut into eight strips, each 1 x 10 ins.; each of these strips contained the same series of densities. Three of these strips received no further treatment. The other five strips were bleached in the same way, and each re-developed in a different formula. When dry, all eight of the strips were mounted together upon a 10 x 8 sheet of clear glass. All the strips were then printed at one time upon a 10 x 8 sheet of positive film, care being taken to print from the "straight line" portion of the strips upon the "straight line" portion of the film.

The "straight line" portion refers to those densities which give the straight line portion of the H. and D. curve of the material. The printing light came from the flashed opal glass window of a white-lined box, illuminated by a gas-filled tungsten lamp. The print was developed in Elon-hydroquinone developer to a gamma of about unity. The resulting densities were read, and the density values were plotted against the logarithm of the exposures given the original negative.

These curves were the reproduction curves, and show in each case how the final positive rendered the original exposures. The greater portion of each of these curves was a straight line. The ratio of the slope of this line for an intensified or reduced negative to the slope for an untreated negative expresses the degree of intensification or reduction; it is the ratio of the effective photographic contrast of the treated negative to that of the untreated negative. This ratio will be designated as $\frac{\gamma\ ip}{\gamma\ op}$, following the terminology of Nietz and Huse[1]. The "effective photographic contrast" means the photographic contrast obtained under the practical conditions of these experiments, and does not mean necessarily true photographic contrast; methods for the determination of true photographic density and contrast are given in "The Spectral Selectivity of Photographic Deposits," by Mr. L. A. Jones and the present writer[2].

Where the value $\frac{\gamma\ ip}{\gamma\ op}$ is greater than unity, the effect has been an increase of photographic contrast or intensification; and where $\frac{\gamma\ ip}{\gamma\ op}$ is less than unity, it represents a decrease of photographic contrast, or reduction of the negative.

By the above procedure each strip of a plate was carried through identically the same process, except for the bleaching out and re-development in various developer formulæ. Any changes in printing contrast observed were due to the bleaching and re-development process. All the negative strips of a set were made upon one plate, which was developed as a unit; the final strips of each plate were printed upon one sheet of film, which was developed as a unit. By this method, any errors due to variations in development or in photographic materials were minimised.

The original negatives were developed in one or the other of these two formulæ:—

Pyro (5-10-10).

Pyro	5 gms.
Sodium carbonate (dry)	10 gms.
Sodium sulphite (dry)	10 gms.
Water to	1,000 c.c.s.

Elon-Hydroquinone (EH_{80}).

Elon	4 gms.
Hydroquinone	1 gm.
Sodium carbonate (dry)	25 gms.
Sodium sulphite (dry)	75 gms.
Potassium bromide	1.5 gms.
Water to	1,000 c.c.s.

The negatives were developed to visual gammas between 0.5 and 1.0. There was no indication that the value of the gamma of the original negative had any effect upon the value of $\frac{\gamma\ ip}{\gamma\ op}$.

The bleaching solutions were made up as follows:—

Ferricyanide Bleach.

Potassium bromide	10 gms.
Potassium ferricyanide	30 gms.
Water to	1,000 c.c.s.

Permanganate Bleach.

A.—Potassium permanganate	4.5 gms.
Water to	1,000 c.c.s.
B.—Sodium chloride	160 gms.
Sulphuric acid	40 c.c.s.
Water to	1,000 c.c.s.

For use, take A, 1 part, B, 1 part, water 6 parts.

After bleaching in permanganate, the negative is cleared in ½ per cent. solution of sodium bisulphite.

After bleaching the five strips of each set in ferricyanide or permanganate, they were exposed to a strong light and re-developed, one strip in each of these developers:—EH_{80}, pyro (5-10-0), pyro (5-10-5), pyro (5-10-10), and pyro (5-10-25); the figures in parenthesis represent successively the concentrations of pyro, sodium carbonate, and sodium sulphite in grams per litre of developer[3]. The re-development was carried to completion, about five minutes' usually being sufficient for this.

Table I. gives the values of $\frac{\gamma\ ip}{\gamma\ op}$ obtained with the various solutions used; each value is the final average obtained from three of four negatives; from one to three prints had been made from each negative.

TABLE I.

Re-development	Original development EH_{80} Permanganate bleach. $\frac{\gamma\ ip}{\gamma\ op}$	Original development EH_{80} Ferricyanide bleach. $\frac{\gamma\ ip}{\gamma\ op}$	Original development Pyro 5-10-10 Permanganate bleach. $\frac{\gamma\ ip}{\gamma\ op}$	Original development Pyro 5-10-10 Ferricyanide bleach. $\frac{\gamma\ ip}{\gamma\ op}$
Pyro 5-10-0	2·00	1·70	1·15	1·80
Pyro 5-10-5	1·50	1·35	·95	1·40
Pyro 5-10-10	1·15	1·15	·80	1·15
Pyro 5-10-25	·95	1·00	·65	·95
EH_{80}	·80	·95	·55	·85

These data are shown graphically in the curves of Figs. 1 and 2, where $\frac{\gamma\ ip}{\gamma\ op}$ is plotted against the sulphite concentration of the pyro re-developer.

Table II. shows the effect of repeating the process, bleaching each time in ferricyanide and re-developing in pyro (5-10-0), to increase the amount of colour in the negative.

TABLE II.

Successive Bleaching and Re-development Pyro 5-10-0	Original development EH_{80} Ferricyanide bleach. $\frac{\gamma\ ip}{\gamma\ op}$	Original development Pyro 5-10-10 Ferricyanide bleach. $\frac{\gamma\ ip}{\gamma\ op}$
Once	1·70	1·80
Twice	2·10	2·20
Three times	2·40	2·45
Four times	2·65	2·70
Five times	2·80	2·85

[1] "The Sensitometry of Photographic Intensification," A. H. Nietz and K. Huse, Jour. Frank. Inst., March, 1918, pp. 389-408.

[2] "Jour. Frank. Inst.," February, 1918, pp. 231-267.

[3] C. E. K. Mees, A New Method of Writing Developer Formulæ, "B.J.," Vol. 64, 1917, p. 535.

Thus the process is capable of successful repetition, in case the previous treatment has been found insufficient. When the process is repeated several times, care must be taken to avoid injuring the softened gelatine surface.

The data of Table I. show that the process is suitable for the intensification of either pyro or Elon-hydroquinone negatives, and for the reduction of pyro-developed negatives. A slight reduction in an Elon-hydroquinone negative is pro-

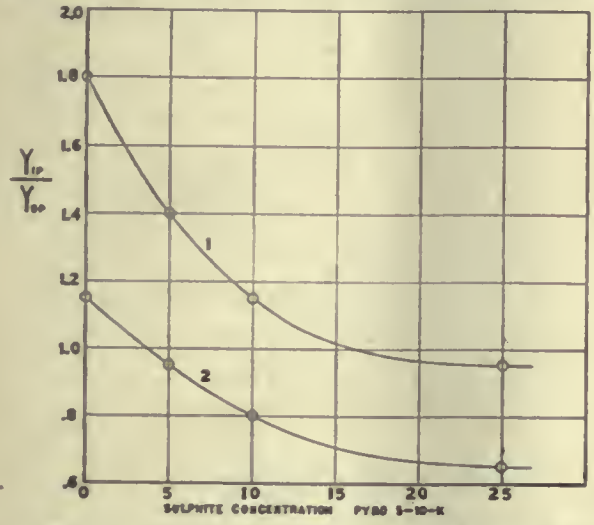


Fig. 1.—Original Development, Pyro 5-10-10. Curve 1, Ferricyanide Bleach. Curve 2, Permanganate Bleach. Re-development Pyro 5-10-x.

duced by bleaching in permanganate bleach and re-developing in Elon-hydroquinone. By re-developing in pyro, any intensification up to double the original photographic contrast can be secured. Nearly as much intensification can be obtained upon pyro (5-10-10) negatives by bleaching in ferricyanide and re-developing in pyro. A pyro (5-10-10) negative can be reduced to almost half its original photographic contrast by bleaching in permanganate solution and re-developing in Elon-hydroquinone. Of course, the amount of reduction possible in this way depends upon the amount of colour in the original negative. Pyro (5-10-10) gives about the same colour as many recommended pyro formulæ.

This method, of course, may be applied with other developing formulæ than those given here. These experiments serve to show the practicability of using the pyro colour as a means of photographic intensification, or the removal of it as a means of reduction.

The advantages of this method are that within certain limits any degree of intensification or reduction can be produced by suitable variations in the sulphite concentration of the pyro re-developer; furthermore, the amount of intensification or reduction is predetermined; it does not depend upon the time

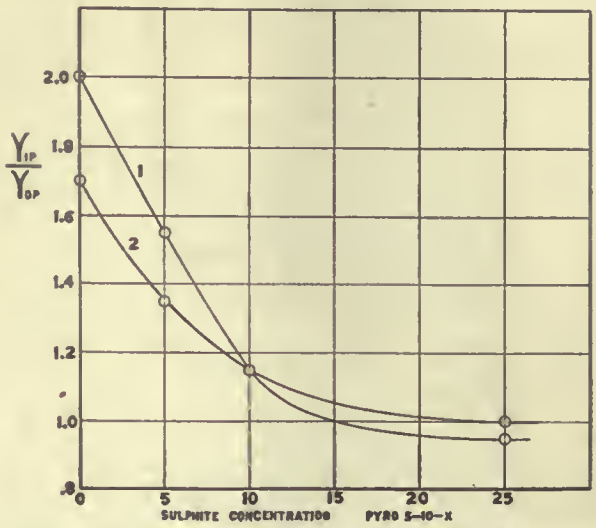


Fig. 2.—Original Development EH_{80}. Curve 1, Permanganate Bleach. Curve 2. Ferricyanide Bleach. Re-development Pyro 5-10-x.

for which the negative is bleached or re-developed, since these processes are carried to completion. The degree of intensification or reduction that can be obtained by this method compares favourably with that of other methods. Nietz and Huse determined $\frac{\gamma\ ip}{\gamma\ op}$ for ten intensifiers; only four of these gave a value exceeding 2, and five of them gave less than 1.5. The fact that the reproduction curves obtained in these experiments have long straight line portions shows that, over the range of densities used, the reduction or intensification is proportional—that is, the contrast is changed by the same ratio for all parts of the negative.

R. B. WILSEY.

FORTHCOMING EXHIBITIONS.

December 20, 1919, to January 24, 1920.—Scottish Photographic Federation. Sec.: John Macdonald, 27, Aberfeldy Street, Dennistoun, Glasgow.

KEROTYPE DEMONSTRATIONS.—By arrangement with Messrs. Marion and Co. the Kerotype process is being demonstrated this week in Messrs. Marion's showrooms, 3, Soho Square, W.1, from 12 noon to 6 p.m., and at the same time a very interesting collection of results by the process is being shown. The great facility of Kerotype paper, as many of our readers doubtless know, consists, first, in its development, fixing and toning like any other development paper, and, secondly, the transfer of the picture to any flat or shaped surface. The process thus lends itself to the production of an immense variety of distinctive effects, some of the most charming of which are those in which the image is transferred to a fabric and the latter dry-mounted in the ordinary way. Professionals will be particularly interested in these latter results, but it is intended to arrange shortly a further exhibition in which the use of the process for professional purposes will be the chief consideration. In the meantime any amateur worker will gather many interesting suggestions from the specimens which are shown. Full technical particulars as to the working of the process may be obtained on application to Kerotype, Ltd., 106a, Upper Tooting Road, London, S.W.7.

THE BIRMINGHAM PHOTOGRAPHIC SOCIETY, after its many moves during the past five years, has secured new rooms at the Birmingham Medical Institute Buildings, Edmund Street (next to the School of Art), and a house warming takes place on December 16 in the form of an autumn and excursion exhibition, which on this occasion is "for members only." As soon as the Society is once again in its stride we hope to see a revival of the annual exhibition, for which it justly had an international reputation. Up-to-date enlarging and dark-rooms are being installed at the new headquarters, and these, in addition to the attractive lecture programme, should draw many new members.

A MILD SENSATION was created recently in a Manchester street, says the "Manchester Evening News," by the appearance in a photographer's shop window of a real live pony and donkey. So large a crowd was attracted by the unwonted spectacle that the traffic was in danger of becoming impeded, with the result that the police intervened and requested the enterprising proprietor to withdraw the animals from public view. A printed notice is now prominently exhibited in the window to the effect that owing to police regulations the pony and donkey have been relegated to the rear of the shop, where customers desirous of being photographed as highwaymen or Wild-West cowboys can be camouflaged as such astride one of these animals.

PRACTICUS IN THE STUDIO.

[Previous articles of this series, in which the aim of the writer is to communicate items of a long experience in studio portraiture, have appeared weekly since the beginning of the present year. It is not thought possible to continue the series to the length of that by the same writer which ran through the "British Journal" some years ago, but if any reader among the younger generation of photographers, and particularly those engaged as assistants, has a particular subject which might be dealt with, his or her suggestion will be welcomed. The subjects of the previous articles of the series have been as follows:—

A Talk About Lighting (Jan. 3).
The Camera and the Lens (Jan. 10).
Managing the Sitter (Jan. 17).
Backgrounds (Jan. 24).
Studio Exposures (Jan. 31).
Artificial Lighting (Feb. 7).
Printing Processes for Portraiture (Feb. 14).
Studio Accessories and Furniture (Feb. 21).
The Surroundings of the Studio (Feb. 28).
Studio Heating and Ventilation (March 7).
The Postcard Studio (March 14).
The Printing-Room (March 21).
About the Reception Room (March 28).
Home Portraiture (April 4).
Portable Studios (April 11).
Copying (April 18).
Handling the Studio Camera (April 25).
More About Lenses (May 2).
Enlargements (May 9).
Advertising the Studio (May 16).
Mounts and Mounting (May 23).
Business Methods (May 30).
Photographing Children (June 6).
Portraits of Elderly People (June 13).
Something about Lenses (June 20).
Hand Cameras for Professionals (June 27).
The Dark-Room and Its Fittings (July 4).
Plates and Their Work (July 11).
Apparatus Repairs and Renovations (July 18).
Posing the Head (July 25).
Intensifying Portrait Negatives (Aug. 1).
Workshop Jobs (August 8).
The Personal Factor (Aug. 15).
The Keeping of Negatives (Aug. 22).
Reduction of Negatives and Prints (Aug. 29.)
Leaky Roofs (Sept. 5).
Blinds and Curtains (Sept. 12).
Miniatures (Sept. 19).
Printing Portrait Negatives (Sept. 26).
Wedding Groups (Oct. 3).
Combination Printing (Oct. 10).
Flashlight Work (Oct. 17).
Flashlight Portraiture (Oct. 24).
The Question of Outfit (Oct. 31).
Telephoto Lenses for Professional Work (Nov. 7).
Changing Quarters (Nov. 14).
CarbonPrinting—I. (Nov. 21).
Carbon Printing—II. (Nov. 28).
Bromide Wrinkles (Dec. 5).

NATURAL POSES OF THE FIGURE.

Posing the human figure so as to give results which are satisfactory to the cultivated eye is not an easy matter—in fact, some photographers who lack the necessary quickness of perception never acquire the art at all, but content themselves with half-a-dozen stock positions and rest content with them. Others, however, feel the necessity for natural and pleasing arrangements, and often feel discouraged through their inability to induce graceful poses with unpromising subjects. To such I would try to give comfort, by pointing out the laborious work often lasting for years which the painter has to endure before he acquires proficiency in figure drawing. The photographer is distinctly better off, for he has not to go through the pains of learning to draw, but can concentrate his attention on learning what constitutes a graceful pose, and, what is equally important, recognising one when he sees it.

There is no better way of acquiring a knowledge of posing than by studying paintings and drawings by good artists, not with the idea of copying the pictures closely, but rather of absorbing their spirit and acquiring what many people imagine to be "the artistic instinct," but which is really the result of cultivating such natural taste as the student originally had in his nature.

It must be conceded that the style and individuality of the model are important factors in the production of a picture. For example, it is useless to try to realise a conception which depends on a tall and graceful figure if the model is short and plump; here another pose which will not emphasise the undesirable characteristics must be chosen.

Nothing is so dangerous as to give positive rules for obtaining artistic poses, but generally it is desirable to avoid either full front or profile views of the figure as these lack animation and produce the undesired impression that the sitter is standing for the express purpose of being photographed. Another thing to be avoided is any attempt to manipulate the sitter into a graceful pose. This is rarely successful, the sitter either appearing stiff and constrained in the attempt to keep a position which is not natural to her, or assuming an expression of boredom and fatigue which will nullify the effect of the most perfect pose. I well remember one very skilful photographer who treated his sitters as if they were clay models. The hands and arms were carefully placed, and every fold in the drapery carefully disposed, but by the time the exposure was made the sitter was on the verge of collapse, and looked it. Far better than this is to observe closely every movement of the sitter while in the studio before any attempt at posing is made, and to choose any position which she may take which gives promise of a picture. It is often necessary to ask the sitter to walk round the studio if the position first taken up appears at all awkward, or even to try a totally different pose, reverting to the first one afterwards. I have found it useful to tell the sitter what to do in the same way as stage directions are given. Thus I would say, "I want you to walk up to the table, pick up the photograph and turn round and tell me what you think of it." Nine times out of ten the sitter catches the idea, and the result is natural and usually more or less graceful. As I have already hinted there are certain types of figure with which a standing pose is impossible, and for these a suitable sitting position must be found which should not be a difficult matter.

With sitting figures the hands play an important part in the composition, and we are here face to face with one of our greatest difficulties. If we compare the hands of the average person with the hands as rendered by portrait painters we are driven to the conclusion that either the painters are very fortunate in finding models with small and graceful hands or that they deliberately represent them on a smaller scale than the rest of the figure. The latter course is impossible to the photographer, and he must therefore endeavour to place the hands in such a position that they appear easy and graceful and must avoid exaggerating their size by faulty management of his apparatus. Here again I urge the operator not to attempt to twist the hand or to alter the position of individual fingers, but to suggest to the sitter what is required until a satisfactory result is obtained. As a rule the hands should not be shown in their full breadth, but more or less edgewise,

and care should be taken that some of the fingers are not closed upon the palm as this frequently gives the effect that they have been amputated. Unless the hands are actually engaged in some action, such as holding a book, arranging flowers, or playing with a necklace, the muscles should be relaxed. The arm of a chair should not be gripped or the hand clenched; above all the fingers should never be interlocked as this gives an excessively clumsy appearance. Many effective poses may be obtained by resting the face upon the hands, the simplest being when the half-closed hand supports one side of the head. In this case one must be careful that the hand only touches the cheek lightly and does not push the flesh up into a lump above it. Other somewhat similar poses are obtained by placing the two open hands together and resting the side-face upon the back of one or by interlacing the finger-tips and resting the chin upon them, the elbows being of course supported upon a table.

It is when the hands rest in the lap or upon the knees that they are usually most obtrusive, and this appearance should not be aggravated by allowing a strong light to fall upon them. A small screen, placed so as to reduce the light on the lower part of the figure, will help considerably in reducing the prominence of the hands. The camera vignetter may even be employed so as to throw the lower part of the figure into semi-shadow. This dodge is extensively used by some successful workers.

The swing-back of the camera is a trap for the unwary when dealing with the hands of a sitting figure. It will, it is true, bring them into focus without reducing the aperture of the lens, but at the expense of increasing their apparent size. With the rapid plates now available it is possible to stop down to a reasonable extent and yet not to cause an unduly long exposure. I have found that excellent results can be obtained by having the camera rather higher than usual and pointing the lens downwards, thus bringing the face and hands nearly upon the same plane. When doing this it is necessary to see that the head is not depressed too much or the picture will not be satisfactory. Fortunately full length portraits are in little demand at the present time except for people in uniform or fancy dress, for in the majority of cases a three-quarter length makes a much better picture. It also places a valuable power in the hands of the photographer as it allows him to reduce the dumpy appearance of a short figure. We may take a three-quarter length of a figure which only just misses the edge of the skirt and give the appearance of a person of average height. With men, a little more care is necessary as the distance between the bottom of the coat or jacket and the edge of the picture must be nicely balanced or the desired effect will not be produced.

I must not forget to remind my readers that the power of suggesting poses to the sitter is of great value and should be cultivated, when the physical attributes of the operator permit—that is to say, that if a movement of the limbs or a pose of the hands is suggested, it is apparently unconsciously enacted by himself. If the head is to be raised or turned, or the hands moved the request may be accompanied by the appropriate gesture, generally with satisfactory results. Even farther than this it is sometimes useful to show the actual pose in the position the sitter is to occupy, and to invite him or her to copy it. Naturally this requires a little study on the part of the operator who must have a proper idea of what he looks like when he assumes certain poses, otherwise he may only succeed in making himself appear ridiculous.

PRACTICUS.

LICENCES FOR RETAIL BUSINESSES.—It has been stated in the House of Commons by Sir Robert Horne, Minister of Labour, that the operation of the Order requiring a licence before a new retail business can be started will be brought to an end on December 31 next.

LENS-SEPARATION IN STEREOSCOPIC PHOTOGRAPHY OF SMALL OBJECTS ON THE SAME OR AN ENLARGED SCALE.

A CORRESPONDENT specially engaged in stereoscopic photography of natural-history specimens often on an enlarged scale recently wrote to us as follows:—

I was much interested in the series of articles you published recently on Stereoscopic Photography.

There was one point which was not touched upon, and on which I have not been able to discover any definite information in any of the literature to which I have been able to refer.

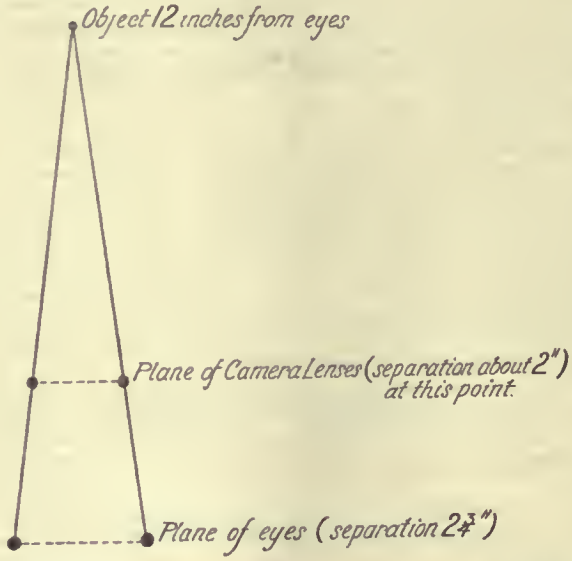
When a near object is to be photographed the separation of the lenses has to be less than the usual 3 ins. employed for distant objects.

Further, when a small object is to be photographed, say, natural size, it is impossible as a rule to get the lenses sufficiently close together, and successive exposures are made by moving a single lens a certain distance on each side of the central line. If the resulting separation is too great, excessive relief is obtained. If too little, there is insufficient relief in the finished stereograph.

The question is what is the rule connecting focal length of lens, magnification and separation to secure true stereoscopic relief?

Accordingly we referred the question to the writer of the articles, Mr. Charles E. Benham, by whom the following graphical solution of the problem is offered in the hope that others interested in the optics of stereoscopic photography may be disposed to discuss it. Mr. Benham writes:—

In the stereoscopy of small objects at a closer view point than the distance of distinct vision (which we will place at 12 ins.), the separation point of the lenses must bear the same relation to the distance from the object to the plane of the lens focal centres that $2\frac{3}{4}$ bears to 12. The following diagram will make this clear, and may be used as a scale to show separation point for the lenses at any given proximity to the object:—



The formula corresponding with this graphic construction is therefore simply 12 : $2\frac{3}{4}$: : distance of camera : separation distance. In other words,

$$\text{separation distance} = \frac{\text{distance of lenses} \times 2\frac{3}{4}}{12}$$

$$= \frac{11}{48} \text{ distance of lenses,}$$

$$\text{or (approximately) } \frac{\text{distance of lenses}}{4}$$

Practically, therefore, a quarter of the distance of lens from object will give the separation distance for objects at close range.

The principle applies equally to magnified objects, the separation distance being arrived at in just the same way when the position of the camera is determined on. The magnification does not vitiate

the principle, because only a smaller portion of the object comes into the field.

Acting on this formula for distances *beyond* the 12 ins. for distinct vision point, the formula would soon lead us astray, and in fact it did lead astray some who in the early days of stereoscopic practice laid it down as a principle of universal application. For objects at a distance of some yards we should introduce a separation distance for the lenses which would be preposterous. The reason for this apparent anomaly is that while 12 ins. may be regarded as the "near point," it is not at the same time the "far point" of vision, that is to say, it is not the limit of distinct vision in both directions of nearness and its opposite. The range of stereo vision with the eye is a wide one, and the separation of 2¾ ins. holds good for a wide range. It is only when we want to give an effect of relief of very distant objects in the form of models seen at closer range that we can legitimately increase the separation of the lenses. On the other hand, in the photography of objects within the limit of distinct vision the proportionate approximation of the lenses holds good.

CHARLES E. BENHAM.

BRITISH PHOTOGRAPHIC MANUFACTURERS' ASSOCIATION, LTD.

ANNUAL GENERAL MEETING.

ON Thursday, November 20, the annual general meeting of the British Photographic Manufacturers' Association was held at the Connaught Rooms, London, Mr. E. W. Houghton presiding. The meeting was preceded by a luncheon, at which about forty seats were occupied.

The President (Mr. E. W. Houghton), in moving the adoption of the annual report and accounts, called attention to the fact that the Association was formed during the early part of the war, and that so far its work had been mainly connected with the war. The printed report dealt with the principal business that had been carried out during the past year, and, without going into detail, he might mention that it had been of considerable assistance to the industry over a difficult period to have one organisation through which to negotiate with the various Government Departments. This was a real advantage, which had been utilised and appreciated by both sides.

Now that the war was over, he (the President) felt that the work which should be accomplished by the Association was just as important in every direction as it had been in the past. He hoped and believed that the photographic industry would never go back to the conditions which prevailed in pre-war times. Then it was customary to regard that which was everybody's business as nobody's business; manufacturers were inclined to look upon competing firms as rivals and enemies. As British manufacturers they were now banded together for the furtherance of the photographic industry throughout the world.

The question of standardisation of sizes of small-plate cameras had been decided and duly announced throughout the photographic Press of the world. The alarm expressed by some had subsided now that the objects of the Association in this matter were clearly understood.

A chart setting out the standard sizes and the numbers by which they would be known would shortly be issued by the Association to all the principal dealers and manufacturers. It would then rest with the camera-makers to adopt the new sizes for their new models. There would be no difficulty with regard to plates and papers; the manufacturers would supply to meet the demand as they always had done.

Mr. Houghton said that the second edition of "The Photographic Industry of Great Britain" was now in the press, and would shortly be distributed entirely overseas. This was in accordance with the original plan of the book. Other co-operative plans were in hand which would apply more particularly to the home country.

The President concluded his remarks by congratulating members upon the satisfactory financial position of the Association as revealed by the audited accounts and balance-sheet, and urged the advisability of a change of officers and members of Council.

A useful discussion ensued, in which a number of members participated. Keen interest in the work of the Association was displayed, and a general desire expressed that the co-operative efforts in the interests of British photographic manufacturers should be extended on the lines suggested by the Council.

The following officers and members of Council were declared elected as a result of the ballot:—

President.—E. W. Houghton.

Vice-Presidents.—J. Hill, G. M. Bishop.

Hon. Treasurer.—E. B. Cook.

Hon. Secretary.—F. E. Greenwood.

Members of Council.—Austin Edwards, W. F. Butcher, O. S. Downing, J. R. Griffin, W. S. Hobson, T. Illingworth, F. J. Jenks, Gray Pickard, C. F. S. Rothwell, S. Whitfield.

Secretary.—Arthur C. Brookes, Sicilian House, Southampton Row, W.C.1.

DEATH OF MR. H. V. HOPWOOD.

IT is with very great regret that we see the announcement of the death on Friday last, December 5, at the age of fifty-three, of Mr. Henry Vaux Hopwood, assistant librarian in the Patent Office Library, where he had followed his profession of technical librarianship for over thirty years. Personally, if not always by name, Mr. Hopwood was well known to visitors to the library at Southampton Buildings, and many have had occasion to appreciate his wide knowledge and invariable kindness and courtesy in assisting the legitimate user of the unique collection of technical books in his charge. Mr. Hopwood was the author of the handbook "Living Pictures," a semi-historical manual on the technics of cinematography, first published in 1899, and now re-issued as "Hopwood's Living Pictures," after having been largely re-written and revised by Mr. R. B. Foster. For some months before his death Mr. Hopwood, who took a keen interest in photographic literature, as well as in the practical processes of photography, had been compiling a bibliography of literature relating to the work of Hurter and Driffield for inclusion in the memorial volume to be published in due course by the Royal Photographic Society. He had in fact been engaged on this work within a few days of his death, which took place suddenly as the result of influenza, followed by pneumonia.

Assistants' Notes.

Notes by assistants suitable for this column will be considered and paid for on the first of the month following publication.

A Glance at Developers.

A STUDY of the Answers to Correspondents page of this journal, or a conversation with a group of photographers, will lead one to the conclusion that although the average photographer knows that he may expect different results from different developers he has not usually a very clear idea as to what results he will get with any particular reagent. The following tables will, I hope, make clear the chief points of interest to the practical worker.

Two tables are necessary because the most important features for plate development may be quite a secondary consideration for prints. To give an instance, pyro metol is frequently used for plates because it makes the best of under-exposures. This is a valuable property, but when it comes to the making of prints it is no advantage whatever.

To take the plate table first. It must be quite clearly understood that the properties of any developer only hold good while it is used in a normal manner. Metol, for instance, is noted for its soft working, and yet by a plentiful use of a restrainer and long immersion in the developer it is possible to get a hard negative with it. The same applies to colour of image; the amount of sulphite, the use of potass. brom., and other things affect this greatly, so that the indications given in the tables are for normal formulæ used in a normal way. In the case of fog I have acted on different lines, as no normal developer will fog a plate of ordinary speed, unless development is carried on for a long time. I have therefore tried to give an indication of the tendency of the developer to fog the plate when development is forced.

The speed is the speed with which normal density is reached—a very different thing, it should be remarked, from the time it takes the image to come up on the surface of the plate. The keeping qualities referred to are those of the developer as usually made up for

use; pyro-soda, for example, being in its two solutions, while M.Q. would be in one concentrated solution.

Now for the paper-developer table. I have left out keeping qualities, as developer for prints is always best mixed just before use. In place of this I have put in the colour to be obtained by toning the image, the bleaching and sulphide process being used. The fog column is also left out, as no standard developer gives it. In conclusion, I should like to say that the results given here are those obtained in practical work. I do not know if they will be found to be the same with all brands of plates and papers, but I believe they will be, except in most exceptional circumstances.—ARTHUR G. WILLIS.

TABLE I.—DEVELOPERS FOR PLATES.

Reagent.	Speed	Tendency to Fog.	Colour of Image.	Contrast.	Keeping Properties.	Remarks.
Amidol	Slow	Very slight	Blue Grey	Soft	Bad	A useful developer where soft negatives are wanted.
Azol	Medium	None	Grey	Soft to medium	Good	Very good for negatives for enlarging. Very clean.
Eikonogen..	Medium	None	Grey Black	Soft to medium	Good	Useful for all round work.
Ferrous Oxalate	Slow	None	Black	Medi'm to hard	Good	A splendid developer for clean negatives, but not suitable for quantity production.
Glycin	Very slow	None	Black	Hard	Good	The best for slow tank work. Most exceptionally clean in working.
Hydroquinone	Fast	None	Blue Black	Hard	Good	Useful for B. and W. copy negatives, unsuitable for general work.
Metol.....	Moderate	Slight	Grey	Very soft	Good	Soft working. Better used with hydroquinone.
M Q	Fast	None	Black	Medi'm	Good	Very useful, but negatives are apt to be disappointing, rather "pretty" than good printers.
Paramido-phenol	Medium	None	Grey	Soft	Good	Useful for general work.
Pyro Soda..	Fast to Medium	None	Warm Black	Medi'm	Moderate	Best of all for all round work. Quick, clean, and negatives of good printing value.
Pyro Metol	Fast	Slight	Green Black	Medi'm	Bad	Makes the best of short exposures. Useful for that, but too apt to fog for general work.
Pyro Ammonia	Fast	Considerable	Brown	Medi'm	Bad	Most adaptable of all developers, but rather troublesome to make up.
Pyro Caustic Soda.	Fast	Slight	Grey Black	Soft	Moderate	Cheapest of all. Quite good for general work.

TABLE II.—DEVELOPERS FOR BROMIDE AND GASLIGHT PAPERS.

Reagent.	Speed.	Colour of Image.	Contrast.	Colour when Toned.	Remarks.
Amidol	Moderate	Grey Black	Medium	Very good	First-class for all work, especially when much toning is done. Must be used freshly made.
Azol	Fast	Black	Medium to strong	Good	Very useful developer for general work, especially where most prints are left untoned.
Eikonogen....	Fast	Black	Medium to flat	Moderate	Useful for soft B. and W. prints, especially enlargements.
Ferrous Oxalate	Slow	Black	Strong	Bad	Not suitable for quantity production, but useful for a clean working developer for special work.
Hydroquinone.	Moderate	Blue Black	Very strong	Bad	Not good alone; much better used with metol.
Metol (Monomet, Scalol, etc.)	Moderate	Grey	Flat	Very good	Somewhat flat-working when used alone, but prints of a good colour, and very fine for toning.
M Q.....	Fast	Black	Medium	Moderate	This varies with proportions of M. and Q., but it is a most useful developer for B. and W. results. Not so good for toning.
Paramido-phenol	Moderate	Grey Black	Medium	Moderate	Useful for all round work.
Pyro Soda	Moderate	Warm Black	Medium to hard	Moderate to bad	Very useful for warm black results without toning, but liable to stain the paper case.

Photo-Mechanical Notes.

Half-tones in Newspaper Illustrations.

Mr. Clement Shorter writes to the "Times" of Saturday last, December 6, as follows:—

"In your note on the purchase of the 'Illustrated London News' and the 'Sketch' by Sir John Ellerman you are guilty of an error in art history which is, perhaps, worth correcting, and which, not without some measure of egotism, I correct in my own interest. When I entered the office of the 'Illustrated London News' as editor exactly thirty years ago this month nearly all the blocks used in the production of that journal were woodcuts. Half-tone process was used very rarely, it being more in evidence in the 'Lady's Pictorial' than in any other journal of that date. I found that the use of half-tone process for drawings in particular was very little in favour, Mr. Bernard Partridge of all living artists being the keenest at that time for its use for his pictures. On January 3, 1891, there were 36 wood engravings in the 'Illustrated London News' to four half-tone or process blocks; on January 2, 1892, there were 21 wood engravings to 12 half-tones. By December 31 of that year there were 32 wood engravings and 28 half-tones. In founding and becoming the first editor of the 'Sketch' in 1893 I was the first to produce an illustrated newspaper consisting entirely of half-tone reproduction. The matter is, perhaps, a small one, but it is the privilege of advancing years to be guilty of reminiscence."

Commercial Aerial Photography.

The "Scotsman," in its issue of December 2 last, gives some particulars of the firm of Aerial Photos, Ltd., 81, George Street, Edinburgh. It states that, as the name suggests, the main business of the company is photography, in which they have been specialising and meeting with every success. Aerial Photos., Ltd., have been recently doing a great deal of this work for several of the large commercial undertakings in Scotland, and at present are engaged in filming the workshops of Messrs. Singers, Clydebank, while in the near future a start will be made with Weir's yards. Though this work is covered by most of the flying members of the company, many of the special commissions are undertaken by Captain A. E. Cooper, whose wonderful gifts in that direction singled him out for the post of official artist to the R.A.F. during the war. All Captain Cooper's work is done in the air, and he does not depend on the camera, but actually sketches and colours his objective while flying. At present some of his work is on exhibition in the Science and Industries Exhibition in Glasgow at the stall of Messrs. William Beardmore and Co., Ltd., the builders of the famous airship R.34. An exhibition of aerial photography is being arranged for the beginning of the year by the Glasgow Corporation, and at it the company expect to show many of the results of their ever-increasing activities.

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Applications, November 24 to 29.

LENSES.—No. 29,442 and 29,443. Objectives for photographic, etc., purposes. L. B. Booth.

CAMERAS.—No. 29,726 Photographic cameras. R. C. Barron and I. Castle.

CAMERAS.—No. 29,189. Photographic cameras. H. Jowett.

AERIAL PHOTOGRAPHY.—No. 29,232. Cameras and negatives for aerial photography. T. E. Moorhouse.

CAMERA SUPPORTS.—No. 29,717. Supports for photographic cameras. J. M. Shaw and R. E. Strange.

CAMERAS.—No. 9,509. Photographic cameras. G. J. Terwiel.

CINEMATOGRAPHY.—No. 29,559. Cinematographs. R. Anderton.

CINEMATOGRAPHY.—No. 29,703. Cinematograph shutter. E. J. Day and C. R. Deering.

CINEMATOGRAPHY.—No. 29,724. Cinematography. S. M. Prokudine Gorsky.

CINEMATOGRAPHY.—No. 29,320. Cinematograph films. F. L. Hancock.

COMPLETE SPECIFICATIONS ACCEPTED.

These specifications are obtainable, price 6d. each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

COLOUR SENSITISERS FOR TWO-COLOUR PHOTOGRAPHY.—No. 134,238 (of September 25, 1918). The invention is for improvements in or relating to colour photography of the class wherein two sensitised surfaces superimposed are simultaneously exposed, and has for its object to render such colour photography more simple in operation. According to the invention, a sensitiser for the class of colour photography referred to above comprises pinacyanol, pinaverdol, pinachrome, flavasine, and ammonia, mixed with water.

Preferably the proportions employed are as follows:—

Pinacyanol	2 grs.
Pinaverdol	6 ,,
Pinachrome	2 ,,
Flavasine	4 ,,
Ammonia .880	4 ozs.
Distilled water	1,300 ozs.

In making up the sensitiser, the first four ingredients in the quantities stated are preferably dissolved in 10 ozs. of boiling alcohol and stirred for ten minutes until thoroughly dissolved, after which 1,300 ozs. of distilled water may be added at a temperature of about 70 deg. F., and then the 4 ozs. of ammonia. The film or plate to be sensitised is immersed in this mixture for about five minutes, and kept constantly in movement. The drying should be effected quickly at a temperature of about 75 deg. F.

A plate or film sensitised by this formula is panchromatic. In operation, one such panchromatic plate may be superimposed with a non-panchromatic plate, such as are already on the market, or two panchromatic plates, whereof one or both may be sensitised according to this formula are employed. The two plates are preferably put with the sensitised surfaces face to face, and may be exposed in any ordinary camera. If a non-panchromatic plate is used, this is preferably placed on the lens side of the panchromatic plate.

The two plates thus superimposed are exposed simultaneously, and the first plate cuts out a certain amount of colour from the second plate, so that the resulting two negatives represent different colour-values, and this difference is made greater by use of the special sensitiser described than is possible with two panchromatic plates, such as are at present obtainable, or one of such known panchromatic plates and a non-panchromatic plate.

The negatives are developed, and from each a positive print is made, one of which may be on opaque paper, and the other on transparent material, such as celluloid These prints are then toned up to different colours, one, say, to an orange-pink tint and the other to a blue; the orange-pink would be employed for the positive, which is produced from the negative that was nearest the lene.

The marked difference of colour-values obtained, owing to the use of the special sensitiser described, leaves room for considerable manipulation of the prints, so that the depth of colour of either may be deepened as required to obtain a proper balance according to the subject in hand. This balance can only, of course, be judged by the operator for each subject, and will depend largely upon individual taste, but the fact that a large difference of colour-value is obtained by means of this invention in the two positives leaves scope for the desired manipulation.

For quick work the two panchromatic plates prepared with the special sensitiser given above is preferred.

If one print is on paper and the other on a transparent material the transparent print will be afterwards superimposed on the opaque print, and the two may then be mounted in any desired manner. With practice, a coloured photograph having considerable resemblance to Nature can thus be obtained.

Although plates have been referred to, obviously films may be employed, and also the finished product may be made as a transparency by utilising transparent material for both prints.

The invention may be applied to cinema films, the celluloid portion of which may be of ordinary manufacture, but the sensitising material for one or both of the films must be made according to this invention. The two films can then be run simultaneously through the camera, and the subsequent treatment will be the same as has been already described with reference to plates, except that the final product will be a transparency

Instead of toning the final product to different colours, the film may be stained the desired colours on opposite sides, though for the production of ordinary coloured photographs the process at first described must be used. For cinematograph work the staining is possible because of the persistence of vision and the strong light behind the film.

Where two panchromatic plates, sensitised according to this invention, are employed, the colour-values are still more widely different, owing to the amount of colour which is stopped by the plate nearest the lens, and this is sometimes an advantage, as it enhances the ease with which the strength of the different tints can be adjusted one to the other.—William Friese-Greene, 106, New Bond Street, London, W.1, and Frank Garrett, 15, Dorset Street, Salisbury Square, London, E.C.4.

Trade Names and Marks.

APPLICATIONS FOR REGISTRATION.

VIGURA.—No. 393,582. Photographic paper. Paget Prize Plate Co., Ltd., 132, St. Albans Road, Watford, photographic plate and paper manufacturers. July 24, 1919.

New Materials, &c.

Tonitol Re-toning Solution. Made by the Hounslow Research Laboratory, 5, Bell Road, Hounslow, Midd esex.

THIS preparation is one for the further toning of prints toned to a sepia by the bleach-and-sulphide or hypo-alum method. It is a clear and colourless liquid of faint odour, and for use is simply mixed with five times its bulk of water. This diluted working bath has a slight though quite positive effect on sepia-toned prints. Its effect may, perhaps, be best described by saying that the reddishness of a sepia print is removed and the colour converted into one somewhat less pronounced, and to many tastes very much more pleasant. We have tried the effect of the solution upon a number of prints, and are certainly of opinion that Tonitol can render a real service to users of the sepia-toning process. The sepia prints require an immersion of only a minute or two in the working bath, and apparently the diluted Tonitol may be used on a very large number of prints without losing its re-toning powers. Most people, we think, will prefer the tone which it yields to the average original result by bleaching and sulphiding, so that photographers generally who may wish for some novelty in the colour of their prints, or experience difficulty in getting regular results by sulphide toning, will be well advised to give Tonitol a trial. The preparation is supplied in 6-oz. bottles, price 3s. 9d. each.

Hard-grade Press Bromide Paper. Made by Criterion, Ltd., Stechford, Birmingham.

A NEW introduction of the Criterion Company, specially for Press photographers, will be accorded a particularly warm welcome at the present time of year, when many negatives are deficient in quality through the hopeless conditions of lighting under which they are taken. The new grade of paper is one yielding a considerable extra degree of contrast; its properties in this respect approach the vigour and brilliancy of gaslight paper, whilst retaining the speed of bromide and the facility of standing forced development without the slightest liability to stain. These are features which for a great deal of current work in Press photography are of much practical value. In other respects, such as its non-stress quality and freedom from mechanical defects and chemical spots, the paper maintains the high reputation of its makers. It is obtainable as white and as mauve, both of glossy surface.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

MONDAY, DECEMBER 15.

South London Photographic Society. The December Competitions: I.—Lecturette Competition. II.—Excursion Slides. III.—"London" Competition.

Dewsbury Photographic Society. "Odds and Ends for Beginners." Councillor F. Newsome.

Willesden Photographic Society. "Straight Photography." T. H. B. Scott.

Bradford Photographic Society. "A Tramp in Teesdale." J. Kaye.

Kidderminster and District Photographic Society. "Mounting." W. H. West.

TUESDAY, DECEMBER 16.

Royal Photographic Society. Technical Meeting. "Fancy Lighting in Portraiture." N. E. Luboshez.

Hackney Photographic Society. Print Competition: Farmyard Scenes.

Doncaster Camera Club. Lantern Lecture: "Berwick-on-Tweed and the Adjacent 'Scot' Country." O. L. Sutcliffe.

Chelsea Photographic Society. "Westminster Abbey." F. H. Evans.

Sheffield Photographic Society. "Peeps at Nature with a Camera." Rev. B. Rotler, S.J.

South Glasgow Camera Club. Lantern Slide Competition and Display of Colour Bromoils.

Leeds Photographic Society. "The Magic Carpet." E. P. Dibden.

Maidstone and District Photographic Society. "The Laws and its Uses." T. W. Dadd.

WEDNESDAY, DECEMBER 17.

Croydon Camera Club. "The Work and Records of the Photographic Survey and Record of Surrey." J. Keowick.

North Middlesex Photographic Society. Examples of Architectural Photography by Members.

Edinburgh Photographic Society. "Gaslight Printing Processes." J. Oliver.

Dennistoun Amateur Photographic Association. Christmas Calendar Competition.

Partick Camera Club. Whist Drive. Competition Prints on View.

South Suburban Photographic Society. "Bully Beef, Greece, and Tommy Atkins in Macedonia." A. L. Fairbank.

Halifax Scientific Society. Whist Drive.

Catford, Forest Hill and Sydenham Photographic Society. Print and Lantern Slide Competition.

THURSDAY, DECEMBER 18.

Rodley and District Photographic Society. Monthly Competition. "Portraiture."

Hammersmith (Hampshire House) Photographic Society. "An Electric Light Demonstration." A. Basil.

The Camera Club. "Lecture on a Musical Subject." E. Fowles.

Richmond Camera Club. "A Demonstration of Platinotype and Satista Papers." C. M. Thomas, M.A.

Brighouse Photographic and Naturalist Society. "Ants: Their Homes and How they Make Them." W. Cliffe.

Aston Photographic Society. Members' Lantern Night.

Wimbledon Camera Club. Monthly Print Competition.

Hull Photographic Society. "A Journey to Mexico and the Far West." L. Whitehead.

FRIDAY, DECEMBER 19.

Dennistoun Amateur Photographic Association. "Contact Printing" W. Foulds.

Bournemouth Camera Club. "The Importance of Photography in the War." H. Dordan-Pyke.

ROYAL PHOTOGRAPHIC SOCIETY.

MEETING held December 9, Mr. W. F. Slater in the chair.

Mr. H. F. Farmer gave a demonstration of the modification of the Ozobrome process to which he has given the name of "Carbro." Its chief difference of procedure from the Ozobrome process consists in the fact that the pigmenting and acid baths are combined into one, which Mr. Farmer calls the "sensitising" bath. The acid in this latter is supplied by the use of the acid salt, sodium bisulphate. By adopting certain definite proportions for the constituents of this sensitising bath and by taking suitable measures for its temperature and time of use, Mr. Farmer has succeeded in reducing the process to a system according to which a carbon tissue of any given colour can be immersed in the sensitising bath for a given time, and can then be depended upon to yield a good carbon print. Working formulæ and instructions having been set forth at full length by Mr. Farmer in an article which appeared in the "B.J." as recently as October 10 last, it is unnecessary to repeat much of his technical discourse, but a few items may be usefully mentioned.

In working the process a useful guide is to regard the time of immersion of the tissue in the sensitising solution as the equivalent of the degree of exposure in making bromide prints. Too short immersion causes loss of detail in the high-lights of the carbon print, whilst too long a time of immersion is the cause of degraded high-lights.

The sensitiser should on no account be used below 55 degs. F. Mr. Farmer had found that below this temperature the bisulphate became largely inert, whilst the chrome alum remained unaffected. The balance of the sensitising bath was thus upset by having it unduly cold. If, on the other hand, the temperature was much above 65 degs. the time of immersion required to be much shorter. So long as the solution could be used at any temperature between 60 and 65 degs. minor differences within these limits would be found to have no effect on the result.

Asked what kind of bromide paper he preferred, Mr. Farmer said that his favourite paper was the Wellington and Ward "Cream Crayon," which he found to be of remarkably tough substance, so that it was possible to make twenty or more "Carbro" prints from it. In reply to another question, he said that he found the surface of the bromide paper, whether matt, semi-matt or glossy, had no effect on the rendering of detail in the carbon print.

In the article in the "British Journal" to which reference has been made, Mr. Farmer included two tables of times of immersion required by various colours of carbon tissue with certain bromide papers. He explained that some papers required other times than these, but if the correct time of immersion was found with a given paper for a given colour of carbon tissue, the time for any other colour of tissue (with the same bromide paper) was then a question of simple proportion

Asked how contrast could be modified in the carbon prints, Mr. Farmer replied that for soft results from bromide prints of somewhat great contrast more bisulphate should be added to the sensitising bath and the tissue immersed for a longer time. For contrast, the bisulphate should be omitted altogether. In order to reduce the time of immersion of the carbon tissue in the sensitising bath, the bath required to be modified by addition of more chrome alum and also more bisulphate.

In the discussion which followed, or rather was interspersed with, the demonstration, Mr. Thomas Manly, who took a seat close to the demonstration table, and showed a truly paternal interest in the process, pointed out that the combination of acid with the pigmenting chemicals in the Ozobrome process was published by himself in a manual issued before the war. Some discussion took place between him and the demonstrator as to the features in the "Carbro" process which were claimed to be new. In the course of this discussion Mr. Farmer said that while his process was based on Ozobrome, and while he had derived the use of bisulphate from Mr. Manly, he had never known the formula for the Ozobrome solution, by which no doubt he meant to say that the proportions in which bichromate bromide and ferricyanide are mixed in the Ozobrome solution had never come within his knowledge.

An interested audience followed the demonstrator in the very successful making of two prints from their respective bromides, and on the proposition of the chairman a very hearty vote of thanks was accorded to Mr. Farmer.

CROYDON CAMERA CLUB.

MR. D. SETH-SMITH, F.Z.S., a curator of the Zoological Gardens, gave a lecture, entitled "Camera Records from the Zoo," which was illustrated by many slides, all interesting, and the majority of first-rate quality.

As regards the lighting of the varied subjects, frequently were obtained striking studies bearing a strong resemblance to the complex schemes often adopted by portraitists of the modern school. In other cases one was forcibly reminded of the tricky and beautiful "back-lighting" effects frequently seen in cinematograph pictures. It is not suggested that Mr. Seth-Smith deliberately set out to secure these special effects, which probably were due to the conditions, nor that, say, the monkey-house is necessarily a suitable place for artists anxious to study unusual methods of illumination; but it is a fact that not a few of the slides were raised from mere technical excellence to things of real beauty by the wonderful play of light and shade revealed. The narrative, too, was excellent, and it was unfortunate that the wretched weather, coupled with chills and colds on the warpath, did not secure the discomfort of an overcrowded room. A most hearty vote of thanks was accorded him.

In a report of a recent lecture given by Dr. C. Atkin Swan at the Club it was stated that more than a doubt was expressed by him as to the possibility of photographing mirages. *Primâ-facie*, what can be seen ought to be capable of being photographed, and

Mr. G. F. Quilter, a professional photographer, of Ingatestone, bears this out by kindly sending a print which he says includes a mirage. He, however, omits to point out what parts of the print represent the actual scene before the camera and which part shows the refracted image. The print was examined by many with great interest, but none would be sure on the point, which is evidence that the mirage must be very distinct indeed. It is a pity a second exposure was not made when the mirage had vanished, as this would have afforded a ready means of comparison.

EDINBURGH SOCIETY OF PROFESSIONAL PHOTOGRAPHERS.

The second annual dinner of the Society was held in Ferguson and Forrester's Restaurant, Princes Street, Edinburgh, on the 1st inst. Mr. Edward Drummond Young, president of the Society, presided over a company of forty ladies and gentlemen, members and guests, which included Mr. Morley Fletcher, Director of the Edinburgh College of Art, and Mrs. Morley Fletcher, Mr. Wm. W. Weir, a representative from the Glasgow professional photographers, and others.—Mr. Robert Scott, in proposing the toast of "The Society," congratulated its members on the attainment of their scheme for the formation of a retouching class at the Art College, and the most satisfactory response which had been made by pupils to join the class. He was sure that under the able tuition and direction of Mr. Young and Miss Grey the pupils would derive the greatest benefit from the class which would be of immeasurable assistance to them in their future careers. Mr. Scott also spoke of the Society's proposal for the training of apprentice photographers in all branches of the art, which would materially assist to maintain the high standard and quality of the work for which Edinburgh photographers were famous. He also commended the Society to proceed with their proposal to hold a professional photographic exhibition in the near future.

Mr. Pelham S. Moffat proposed the toast of "The Guests."—Mr. Morley Fletcher, in reply, said that the number of pupils enrolled at the College for the retouching class had been a revelation to the Board. They had prepared for thirty pupils, but altogether sixty-nine had been enrolled, which showed there was a clamant need for such a class. He assured the Society that the Directors would do everything in their power to assist the Society in promoting the teaching and training of students in further branches of photography in which artistic knowledge formed the foundation. He was very much interested in the proposal to have a professional exhibition. He thought it would have a most stimulating and helpful effect.

Councillor Drummond Shiels proposed "The Ladies," and Miss Grey suitably replied. A most successful and enjoyable evening, interspersed with music, was spent.

Woolwich Photographic Society.—The annual general meeting took place on December 4 at the Presbyterian Church Hall, New Road, Woolwich, the new headquarters of the Society. The chair was taken by Mr. H. Furlong, and the offices were filled as follows:—President, Mr. H. Furlong; Vice-Presidents, Messrs. F. W. Machen, G. F. Meinertzhagen, C. P. Spiller, and F. Miles; Committee, the Misses Middlebrooke and D. Radcliffe, Messrs. J. R. Baker, G. R. A. Hodsoll, J. Pinches, F. J. Poulton; Treasurer, Mr. D. Collins; Financial Secretary and Consul, Mr. J. McCarthy; Librarian, Mr. C. P. Spiller; Publicity Secretaries, Miss Middlebrooke and Mr. C. P. Spiller; Lanternist, Messrs. F. G. B. Foster and G. R. A. Hodsoll; Auditors, Messrs. T. Hughesdon and Major R. J. O'Connell; Hon. Secretary, Mr. H. H. Clare, Electricity Works, Plumstead.

The Society is to be affiliated to the Royal Photographic Society and to the South-Eastern Union of Scientific Societies.

South Suburban Photographic Society.—The members of the South Suburban Photographic Society had one of the greatest surprises of their lives on the 3rd inst., for, on the President calling upon Mr. Ivor Nixon to deliver his lecture on "Make Your Own Printing Papers," there appeared at the demonstrating table a youngster who was fourteen years of age last August. With the greatest confidence and gravity this "little visiter" lectured to the greybeards and others on the making of ferro-prussiate, plain salted, Kallitype, and phosphate papers, papers he has been experimenting with for about a year. The unconscious humour of some of the remarks contained in his somewhat lengthy "paper" was most original and refreshing, but any adverse criticism was quickly disarmed by the really excellent prints made and shown to illustrate the various coatings, tonings, etc. Master Nixon, after much experimenting, has come to the conclusion that "there is no satisfactory method of intensifying blue prints," that "the best toner for blue prints is the catechu," but "with great care pleasing tones may be obtained by bleaching in weak ammonia and darkening in gallic acid." Toning blue prints, however, was a task not recommended. Although the blue prints were so good, the young lecturer was at his best when dealing with plain salted papers, a branch of work he appears to have thoroughly mastered. The quality of the prints was exceptionally high and the tones exquisite, particularly those obtained by means of the gold and soda phosphate bath. The somewhat complicated Kallitype process frightened not this youthful experimentalist, who tackled it and investigated all the little by-ways with the greatest enthusiasm, and the prints he showed were the most perfect examples ever seen at the club, the range of colours being particularly wide. Standard formulæ, as may be found in text books, were used, though the lad confessed to making a few minor alterations in some; not, however, of sufficient importance to be chronicled. All the chemicals necessary for the making of the four papers named could, he said, be obtained from Towson and Mercer, 34, Camomile Street, London, E.C. Master Nixon was not quite so successful with his phosphate paper, but he is certain to master the process in time, as he has done the other papers named. At the moment, however, he is busy simplifying the art of making dry-plates, and the members are looking forward to another instructive lecture by the youth on plate making. For one so young, the lecturer appears to have a particularly good knowledge of photographic chemistry, and his début as a lecturer, as well as an amateur maker of sensitive papers, can be written down as a big success.

News and Notes.

J. F. Shew and Co.—We learn that Mr. Albert J. Garrad, formerly manager of Messrs. J. F. Shew and Co., is shortly restarting business under the title of J. F. Shew and Co., at 21, Bartlett's Buildings, Holborn Circus, London, E.C.1. It is hoped to have the business in working order early in 1920, with a full range of cameras which will be improvements upon the regular well-known Shew patterns, and in which the Shew Press cameras will be a notable feature. For the present inquiries should be sent to the temporary address, 9 and 10, Thavies Inn, Holborn Circus, London, E.C.1.

Fifty Thousand Photographs Per Second!—A Reuter report from Paris to the effect that two French experimenters, MM. Abrahams and Bloch, had devised an apparatus for taking photographs at the rate of 50,000 per second (according to other reports, 500) has aroused some interesting versions in the lay press, from which it appears that the system consists in the use of a continuously moving sensitive film and a rapidly intermittent service of light such as an electric spark. The technical aspect of the invention was well discussed with the London correspondent of the "Manchester Guardian" by Mr. S. J. Cox, who is the joint inventor with Mr. H. Workman of the Cinephrome (Ltd.) Camera. Mr. Cox pointed out that the achievement was really a development of an apparatus invented by M. Lucien Bull, of Paris, in 1904. He did not doubt the statement that 500 photographs could be taken in a second, but for practical purposes the invention had very important limitations. There were two methods of taking high-speed photographs. Under the spark system the film was moving continuously and the illuminating point was intermittent, while the reverse was the case in connection with the method under which they had been working in London, for the film moved intermittently and the light was continuous, enabling about 250 photographs to be taken in a second. A disadvantage of the spark method was that the photographs were limited to a very small surface, such as a fly crossing a 4 or 6 in. circle, because the only source of illumination was from an electric spark thrown

through a condenser, the object photographed being between the condenser and the camera.

Another important disadvantage was that the object to be photographed would have to be taken to the laboratory. Where the film moved intermittently the camera can be taken out into the open, and the object to be photographed is in the whole field of vision in exactly the same manner as an ordinary cinema. By this method eleven pictures had been obtained of the firing of a howitzer between the explosion of the fuse and the shell leaving the muzzle. In addition they had taken 160 to 200 pictures of a single complete step of a man walking at the rate of four miles an hour.

Very useful photographs have also been taken of surgical operations, especially in cases where the surgeon has been compelled to move so quickly that the actual operation was barely visible to the students gathering round.

On the other hand, a usefulness for the "spark" method could be found in taking small objects, such as bullets or insects, when the exposure would have to be something like a hundred-thousandth part of a second. The bullet could then be shown in its flight.

From the medical point of view, he added, the spark method cannot mean a revolution in experimental science, because, so far as he was aware, the resources of the cameras already existing had not been taxed. Unless there was something not disclosed at the tests he did not think that the new system would mean anything like a revolution in connection with such experiments.

Commercial & Legal Intelligence.

NEW COMPANIES

Developers, Ltd.—This private company was registered on December 2 with a capital of £10,000 in £1 shares. Objects: To carry on the business of manufacturers of and dealers in photographic dry-plates, papers, and films for photographic and other purposes, etc. The subscribers (each with one share) are:—H. J. Wakefield, 17, Burghley Road, Leytonstone, N.E., clerk; E. T. Church, 33, Solon New Road Clapham, S.W.4, clerk. The subscribers are to appoint the first directors.

Hanco, Ltd.—This private company was registered on November 28 with a capital of £5,000 in £1 shares (2,000 pref.). Objects: To take over the business of a photographic dealer carried on by P. G. Hunt at 86, Milton Road, Hanwell, as "J. E. Hart and Co. (London)." The subscribers (each with one share) are: P. G. Hunt, 86, Milton Road, Hanwell, photographic dealer, J. E. Hunt, 4, Willcott Road, Acton Hill, W.3, photographer. The first directors are: P. G. Hunt and J. E. Hunt (both permanent). Registered office: 86, Milton Road, Hanwell, Middlesex.

Correspondence.

**** Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

**** We do not undertake responsibility for the opinions expressed by our correspondents.*

THE DEVELOPMENT OF LANTERN SLIDES.

To the Editors

Gentlemen,—Will you permit me to correct an inaccuracy in the report of Mr. Liesett's lecture at the R.P.S.?

I did not say I "knew of no way of working, except by examining the transparency." On the contrary, I advocated, first, the advisability of ensuring correct exposure by paying attention to the density of the negative, the strength of the illumination, and the speed of the lantern plate; and, secondly, the controlling of the degree of development by the use of the Watkins factorial method.—Yours faithfully,

W. B. Ferguson.

48, Compayne Gardens, N.W.6.

Answers to Correspondents.

SPECIAL NOTICE.

In accordance with our present practice a smaller space will be allotted to replies to correspondents.

We will answer by post if stamped and addressed envelope is enclosed for reply: 5-cent International Coupon, from readers abroad.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

C. C.—The makers of the Jay Nay specialities are Messrs. J. and A. Wilkinson, 60, St. Oswald Street, Manchester.

W. H.—By far the most usual method in the trade is by stripping from glass, the glass being cleaned either with French chalk or with one of the glazing preparations, such as ox-gall.

P. A. G.—Printer's engineers, such as Hughes and Kimber, 9, Gough Square, or Furnival and Co., 102, Clerkenwell Road would supply embossing or blocking presses such as you require.

E. B.—Apart from the little Panoram Kodak, the only two panoram cameras are the Cirkut of Kodak and the Al Vista of Houghton's. Both of these are of American make, and it is therefore doubtful if you can get them now.

F. D.—A total c.p. of 6,000 is enough for all ordinary purposes. We should, however, prefer six 1,000 c.p. to three 2,000 c.p., as the light could be better distributed. We do not, however, know what form of reflector you are fitting, so cannot advise on fixing diffusers.

T. J. G.—You will find the half-watt lamps quite satisfactory. If you write to the General Electric Co., Ltd., 67, Queen Victoria Street, London, E.C., they will send you a booklet giving full particulars of the various fittings from which you can select those best suited to your studio.

W. J.—Your prints are evidently *under*-exposed. You must bring your lamps nearer to the sitter; 2,000 c.p. is hardly enough for short exposures. Your plates, too, are rather slow; try a 400 H. and D. plate, such as the Ilford Zenith. You do not give aperture of lens; for such work it should not be less than *f*/6.

B. and S.—If the business was established before February, 1918, it is not a new business within the meaning of the Order, and therefore no licence is necessary. There is nothing in the order which causes an old business to become a new one, simply from the fact that the original proprietor has joined himself in partnership with someone else.

H. G.—For the starting of any new business, either by a British subject or by an alien, a licence is required. You had better apply for information to the Secretary, New Retail Businesses (Licensing) Order, 99, Queen's Gate, South Kensington, W. A photographic studio, as regards the parts of the premises where the public are received, comes under the Shops Act.

E. A.—The lens you describe is an ordinary or Petzval portrait lens, probably of French make, issued by the Photographic Artists' Co-operative Supply Association, which carried on business in the late '70's. Two lenses marked No. 3 were issued: one 3¼ ins. in diameter was priced at £5 15s. 6d. and the other 4¾ ins. in diameter was £19 16s. Both were listed for cabinet size. We can give no idea of their present value

A. V. C.—(1) The licensing office for the Cambridge area is at 80, Westbourne Terrace, Paddington. (2) We advise you to use the pyro-soda formula recommended by the makers of the plates you are using for dish development, but making it up with, say, three times the quantity of water and using twice the quantity of sulphite or metabisulphite. This will probably give you a tank developer yielding satisfactory average density in about twenty minutes, but you can best discover for yourself whether you require to take more or less water than indicated above by trying the developer on a few plates.

J C.—We think that in the event of it coming to a County Court summons you would succeed in recovering such a charge as 10s. 6d. for your attendance in the effort to carry out the order. The doubtful thing is that apparently the order was a verbal one. If you had an order in writing we should feel more confidence in advising you as to the view which a County Court judge would take. But where the evidence on both sides is wholly verbal, common justice is apt to go astray.

W. H.—A burnisher is only suitable for prints on glossy paper which have been wet mounted The gas must be lighted inside the hollow roller and the temperature allowed to reach that of an ordinary laundry iron. If too hot the prints will burn or blister; if too cold there will be no gloss. The prints should not be bone dry, and should be placed face down on the hot roller, then fed through two or three times, curving the ends upwards as they pass through. When cool they will be flat. The roller must be kept brightly polished and free from scratches.

T. L.—There is unfortunately no book which we can recommend to a photographer of your experience. There was a very excellent book issued by Mr. Batsford some years ago called "Art Principles in Photography." We acted as agents for Batsfords and sold a fair number of them, but the book is now out of print. You could perhaps get a copy by inserting a small advertisement for it. A book which perhaps you might study with advantage from the art point of view is one called "The Appeal of the Picture," by F. C. Tilney, published by Messrs. Dent. It deals about as much with landscape as with portraiture, but is a very excellent book from the art standpoint.

E. S.—The question you ask has not, so far as we know, been generally decided under the Retail Businesses (Licensing) Order. Generally speaking, the object of the Order is to protect demobilised men like yourself, but it is conceivable that your caravan business would operate harmfully in certain places upon ex-Service men who had returned and started in business in a small town or village. Therefore we imagine that your case would be decided on its merits, and with reference to the scope of your journeys. If these are in Leicestershire you had better write for particulars to the office which deals with this district—namely that at 80, Westbourne Terrace, Paddington.

P. H.—1. The addition of a photographic portrait business to a mantle business is the starting of a new business according to the Retail Businesses (Licensing) Order, administered by the Ministry of Labour. 2. The application for a licence could be refused, but we do not know the precise reasons by which the administrators of the Order are guided. The main one presumably is that the new business is being started upon a new beat, where a man who has served in the Army, or is still serving there, previously carried on his trade. 3. We think you are entitled to a week's notice or a week's salary in lieu of notice. The fact that a licence has or has not been obtained has nothing to do with you. The employer must take the liability for that.

E. G. B.—The print must be made on very thin paper, and for this reason albumenised paper was formerly used. If P.O.P. is used, it should be hardened in formaline to prevent the film from melting. A solution of gelatine, say 1 oz. in 50 of water, is made, and while quite warm is poured into a dish of sufficient depth to cover both glass and print, which should be immersed for two or three minutes till quite warm. The print is pressed into contact with the glass with the fingers, and the surplus gelatine wiped off after the glass is nearly cold. In place of warm gelatine a cold solution, made of gum tragacanth, 3 parts; gum arabic, 10 parts; water, 50 parts, may be used in the same way. The print must be soaked until very limp.

R. D.—The only possible light is flashlight, a serviceable outfit for which is obtainable from Messrs. Johnson and Sons, Ltd., 23, Cross Street, Finsbury, London, E.C. A machine for generating electric current would weigh something in the neighbourhood of half a ton. For printing and enlarging machines apply to Mr. G. S. Moore, 69-73, Denmark Hill, Camberwell, London, S.E.5, or Messrs. Brodrick, Ltd., 50, High Street, Charing Cross Road, W.C.2. Combined developing and fixing is no good for this work. Use a quick-acting developer and a strong acid fixing bath. There is no book on the subject, although articles on putting work through with speed have been published in the "B.J." from time to time, for example, on May 21, 1915, and December 3, 1915. Both these will be useful to you. Price 4½d. each post free from our publishers.

G. S.—(1) The lamps are made by Blanchard Lamps, Limited, 151, Farringdon Road, London, E.C. For short exposures you would want at least two of the high-power lamps, which the firm rates, I think, at about 1,000 c.p., and supplies, so far as we recollect, at about £20. This was the price two or three years ago. We think the lamps would last for a good many years. The chief drawback to them is the amount of heat they give out, also the rather great over-all length. Both of these features make it rather difficult to use the lamps in a small and particularly a low studio (2) The Licensing Order is still in force in regard to businesses started since February, 1918. There is no office at Derby. Applications relating to Derbyshire should be addressed to New Arts Buildings, Liverpool; those in respect to places in Nottinghamshire, to Harewood Barracks, Woodhouse Lane, Leeds.

COPYRIGHT.—I have a photograph of Belvoir Castle, given me some years ago. It has no name on it, and I do not know by whom it was taken, although I imagine it is the work of a professional photographer. I would like to have a negative made from it, so that I could make a few bromide enlargements. Do you consider me free to do this without infringing copyright? In order to maintain copyright, is it not necessary to intimate on the print that the same has been protected?—BELVOIR.

It is almost certain that copyright exists in the work, in which case you will be committing a legal infringement by copying it in any shape or form. It is not necessary that the word "Copyright" should appear upon photographs which enjoy copyright protection. At the same time, the reproduction which you appear to contemplate is on a small scale, and if it came to the knowledge of the photographer would scarcely be considered worth while troubling about—at any rate, if the prints are made simply for your personal use and not in any way for trade purposes or for reproduction in any periodical

The British Journal of Photography.

Line Advertisements.

Charges for Insertion.

Since advertisements cannot be inserted until fully and correctly prepaid, senders of line announcements are asked to bear in mind the scale of charges. They will thus save themselves delay in the publication of their announcements. A Schedule by which an advertisement can be correctly priced will be sent on request.

Net Prepaid Line Advertisements.

12 words or less 1/-
Extra words ... ... 1d. per word.
(No reduction for a series.)

Special Note. Box Number Advertisements.

"Box No." and office address ... ... charged as 6 words.
For forwarding replies add ... 6d. per insertion for each adv't.
If replies are called for this latter charge is not made.

Advertisements cannot be inserted until fully and correctly prepaid.

Orders to repeat an advertisement must be accompanied by the advertisement as previously printed.

Advertisements are not accepted over the telephone or by telegram.

The latest time for receiving small line advertisements is 12 o'clock (noon) on Wednesdays for the current week's issue.

Displayed Adv'ts should reach the Publishers on Monday morning.

The insertion of an Advertisement in any definite issue cannot be guaranteed.

HENRY GREENWOOD & CO., Ltd., Publishers,
24, Wellington Street, Strand, LONDON, W.C. 2.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3111. Vol. LXVI. FRIDAY, DECEMBER 19, 1919. Price Twopence.

Contents.

	Page
Ex-Cathedra	735
Titles in View Negatives	735
Enlarging and Reducing in True-to-Scale Processes. By D. Charles	736
Practicus in the Studio. By Practicus	739
A Small Finishing Plant. By O. W. Greene	739
Assistants' Notes	743
Patent News	744
Meetings of Societies	745
News and Notes	746
Commercial and Legal Intelligence	746
Correspondence— Lens-Separation in Stereoscopic Photography of Small Objects on the Same or an Enlarged Scale—A Warning as to the Use of Formaline in Tropical Development	746-747
Forthcoming Exhibitions	747
Answers to Correspondents	747

The Summary of contents which usually occupies the lower half of this column will be found at the foot of the page overleaf and will be placed there whenever its regular position is required for notices relating to the forthcoming "B.J. Almanac."

A Book Within a Book.

The forthcoming "British Journal Almanac" is more than a collection of the hints, expedients, and formulæ of the year, valuable as this *résumé* of the year's progress is to everyone doing practical photographic work.

The 1920 "Almanac" will contain also within its covers a little book which is written specially for the beginner in photography, yet will be found deserving of the attention even of those of wider experience.

This is the section of the "Almanac" entitled "Beginners' Failures in Photography." In it the defects which can arise in the making of negatives and prints are considered according to a systematic plan. The basis of the arrangement is that the defect is described as specifically as can be done in words, and the causes and remedies (or preventives) dealt with in a full yet simple way.

In this article of over fifty pages, chief consideration is given to defects in negatives from thinness, flatness, hardness, excessive density, stain, fog and like defects.

There is a good deal to be said for arranging instruction on these lines, for, apparently, many a beginner will gather experience in the proper carrying out of intensification or reduction when the process is prescribed as the cure for a defective negative who will not take the trouble to read a text-book which has intensification or reduction for its subject.

The article deals also with the causes of various kinds of spots, bands, lines, patches, and other markings on negatives, and serves to show the reader by what exceedingly simple causes some of the most mystifying defects are produced.

The concluding chapters of this "little book" deal with bromide and gaslight printing, making self-toning prints, mounting, and dry-mounting—all "according to the plan."

EX CATHEDRA.

Threepence on Jan. 2. Beginning with the issue of January 2 next the price of "The British Journal of Photography" will be threepence. The increase of price has, unfortunately, become necessary through successive increases in the cost of printing, coupled with the stabilising of a high price for paper. Printing charges, successive increases in which came into force during the war, have during the last few months advanced by a further very substantial amount. As regards paper, while it was possible during the latter part of the war to compensate for the greatly increased cost of paper by a somewhat lesser number of pages in each issue of the "Journal," such a course is no longer possible without a departure from our policy of making the "B.J." representative of all that makes for progress and advancement in every department of photography. Our publishers therefore have no alternative but that of increasing the price charged for the paper to threepence, an advance of 50 per cent., which may be thought to be a very moderate one indeed when set against the threefold price now charged for both paper and printing.

* * *

Shading. It is a matter of some difficulty when shading a portion of a negative when printing to prevent a more or less hard outline where the shaded part merges with the rest of the picture. When printing-out paper is employed the usual and the more satisfactory method of shading during the exposure is by the use of a piece of card moved backwards and forwards over the part of the negative that it is desired to retard; yet this plan tends to give hard edges. A good way to avoid this defect is to cut a series of fairly deep saw-like segments into the card at its edge, bending these in an upward and downward direction alternately. This idea is based upon the old-fashioned paper mask or vignette used years ago, the edges of which were cut in the same fashion as the teeth of a saw. It will be found that if the plan mentioned above is carried out and the printing frame kept in fairly weak light during the exposure a very much softer result will be secured and probably one that will give no indication that shading has been done. With development papers it will also serve, providing the printing light is well diffused and the card kept in motion. Of course, the idea cannot be carried out with the printing machines and boxes so much used to-day. If a negative needs local shading the printing frame should be employed, when the above method will be found to repay a trial.

* * *

The Index Habit. With next week's issue of the "British Journal" will be presented, unless nothing unforeseen intervenes, the index to the present 1919 volume. We take some considerable interest in the compilation of the index to the "B.J." and think we may claim for it

that it provides a very clear and commonsense guide to the varied contents of the volume. In our own office work, chiefly of replying to correspondents, we constantly have to refer to the indexes of past volumes and are often prompted to wish that a greater number of our querists would preserve the indexes. Many people, we can understand, cannot afford the shelf-room for the storage of bound volumes of the "Journal," but if they are under any frequent necessity of addressing queries to us they would save both themselves and us a good deal of trouble by making use of the indexes. A fair proportion of the questions which reach us consist of requests for some formula or prescription which "was given in an article some months ago." Such queries afford a wide field for search, whereas if the questioner would take a glance over the indexes he could probably spot with fair certainty at any rate the two or three articles in one or other of which is to be found what he is seeking. As will be seen from the index to the present volume, now almost ready for publication, no attempt is made to classify the contents, but the simplest A B C arrangement is adopted.

* * *

Light-Control. A great many photographers rely almost entirely upon the studio blinds or curtains for controlling the lighting, and seem to be oblivious to the utility of portable screens for locally shading such portions of the subject as may need it. Frequently the drapery and the face require different degrees of illumination, and very often one or the other is sacrificed. The ordinary white head screen is now pretty widely used, but it is not the best thing when it is desired to tone down a glaring white dress so that it will take its proper place in the scale of tones. For this a similar screen covered with black gauze will be found much better, as it subdues without scattering the light. "On the other side," a rather large circular screen covered with very thin tracing cloth, with a circular opening a foot or fifteen inches across, is frequently used to secure a strong illumination of the head and a subdued one of the drapery. Unfortunately, it is almost impossible to buy the ordinary pattern of head screen at present, but anyone with a little mechanical skill can make a fair substitute with a disused head rest and a few feet of stout wire.

* * *

Time is Money. It is usual in trades where labour forms the largest item in producing an article to keep a careful record of the time taken on each of the stages of production, so that when the job has to be charged up there is no uncertainty as to the cost under this heading. This practice does not, we believe, obtain to any great extent in photographic establishments, although we know of one or two where it is carried out with very satisfactory results. Now that wages have increased all round, it is very necessary for photographers to be certain that their work is not costing more than they obtain for it, or, at all events, more than it should do. This applies more to wholesale trade and commercial firms than to portraitists, as the latter charge on a totally different basis, and it is only a question of a smaller profit instead of actual loss. It is a curious fact that the worst offender is usually the single-handed worker, who very often does not get for a completed job as much as he would have to pay a competent assistant in wages alone for doing the whole work. We recently went into this matter over an order for groups taken at a distance from the studio, and found that the time occupied, at eighteenpence per hour, amounted to about 20 per cent. more than the total amount charged. He charged more for the next similar job.

* * *

Paper Negatives. When enlarged negatives have to be made from faded and granular originals, there is often an advantage in using either the special negative paper or even ordinary smooth bromide paper, instead of the usual glass plate, for not only is the cost much less, but the necessary working up is much more easily effected. As everybody who has worked up an enlargement knows, no medium or other preparation of the surface is necessary, and blacklead, chalk, or water-colour may be used with equal facility on either side. It is usually recommended to oil or wax the paper to reduce the time needed for printing, but, in our experience, this causes the grain of the paper to become more noticeable, and we have found it better to leave the paper in its ordinary state. If ordinary paper is chosen, it should not have a baryta substratum, but should leave the emulsion coated direct upon the base. We have found the Ilford smooth, rapid grade excellent for this purpose. About double the exposure necessary for an ordinary enlargement should be given when enlarging from a small transparency, while the exposure when making the negative direct from a small print should be ascertained by means of a small trial strip.

* * *

"Rembrandt" Lighting. One of the difficulties encountered in making portraits in the "Rembrandt," or, as the Americans more correctly call it, "edge-lighting," style is the exclusion of unwanted light from the lens. It is a common experience to find a general fog all over the negative, and many operators have come to consider this as inevitable, while others, by means of lens

SUMMARY.

The Christmas Holidays. Will correspondents and advertisers kindly note that next week's "B.J." will be closed for press at noon on Monday next, December 22.

Beginning with the issue of January 2 next the price of the "British Journal" will be threepence weekly. (P. 733.)

The Index to the 1919 volume of the "British Journal" will be presented as a Supplement to next week's issue.

In a contributed article Mr. D. Charles describes a simple device for obtaining accurate reproductions of scale in the copying of originals in the camera for reproduction by one or other of the true-to-scale processes. (P. 736.)

In an article contributed to our contemporary "Camera Craft" Mr. G. W. Greene describes at length the outfit found most efficient for the development and printing of amateurs' film negatives. (P. 740.)

In his article this week "Practicus" deals with the making of reproduced negatives, and has a number of hints to give on the method which usually it is most advisable to adopt. (P. 739.)

Some notes on the relative merits and drawbacks of the different processes for the toning of bromides will perhaps add to the information of those who have used only the bleach-and-sulphide method. (P. 743.)

In a leading article we give working instructions in the neat introduction of titles and other lettering in view negatives. (P. 735.)

Double-pose portraits, enlarging with metal-filament lamps, supplementary lenses, spots on blotting boards, and elementary properties of lenses are the subjects of brief replies to correspondents. (P. 747.)

A firm undertaking aerial photography has announced that over a quarter of a million pictures have been made and sold in a few months. (P. 747.)

An Australian correspondent warns against the after-effects of formaline when used in the tropics as a means of hardening the gelatine films of negatives. (P. 747.)

Details of a rotary print-drying machine are given in a recent specification. (P. 744.)

A shading screen of black gauze is a very useful accessory in the studio, particularly when it is wished to reduce the tone of a white dress. (P. 734.)

The photographer's own labour is very often grossly undercharged in fixing the price of work done away from the studio. (P. 734.)

Smooth bromide paper is an excellent sensitive material for the copying of many originals. There is no need to oil or wax it for printing. (P. 734.)

hoods and other more clumsy devices, have managed to reduce it to a considerable extent. We have lately seen a very simple device, which almost entirely does away with the trouble, and has the advantage of remaining in position, no matter how the camera is moved. It consists of a dark card about a foot square, having a cabinet-sized opening cut in the centre. This is fixed in the ordinary camera vignetter in place of the serrated card usually employed. The card is adjusted so as to darken all the focussing screen, except the portion actually occupied by the image, this being easily done by temporarily removing the ordinary carte or cabinet mask from the camera back and manipulating the vignette till only the size of the plate to be used is uncovered. It is obvious that as the lens cannot see the window or other source of light the fogging effect is practically eliminated.

TITLES IN VIEW NEGATIVES.

The lettering of the negatives which a photographer uses for his production of view postcards appears to be one of those operations which is very largely done in an amateurish way. Were it not that we are constantly in receipt of queries as to the best way of doing it, we should have thought that the professional method of setting about it was familiar to all our readers. On the contrary, it appears, from many view postcards which come into our hands as examples of defects of printing or toning, that many small publishers of view cards do not seem to realise the unsightliness of the lettering which often is a disfigurement of really good photography. It cannot be expected that the locally produced postcard can compete with that of the large postcard publisher if attention is not given to every item of detail, including this of the lettering. It may therefore be a service to many others of our readers than those who have specifically put the question to us if we refer once again to the method of providing titles on view negatives by which the lettering can be done in a workmanlike manner.

Briefly, the method consists in photographing the words of the title (in the form of a proof from type-setting or of an original hand-drawn on a considerably larger scale) down to the required size, and transferring, by stripping, to the view negative. Naturally, a much neater result is obtained by setting up the titles in type and taking a good proof from the type matter. If the cost of sufficient type for this purpose cannot be incurred, or if a local printer cannot be commissioned to do this part of the work, a very fair substitute for it is available in the method of drawing the printed characters for the title upon a considerably enlarged scale—say, five or ten times the size which the letters are required to be in the negative. Any roughness of outline due to the hand method of producing the original thus largely disappears in the small scale reproduction: good shape of the letters themselves and conformity to a given style of type may readily be secured by making up a set of sufficiently large letters from a printer's or type-founder's catalogue and tracing these, when evolving the title, upon engineers' tracing cloth, which is then backed up with white paper for photographing.

In making the negative it is customary to photograph a fair number of titles together. The best plate for the purpose is one of the "process" or "photo-mechanical" kind, with which clear lines (the letters), in conjunction with opacity of the ground, are readily obtained with an ordinary pyro-soda or hydroquinone developer. The negative having been developed, fixed, washed, and dried, the film is cut through to the glass with the aid of a straight-edge and a sharp penknife, so as to divide the different titles into separate sections of emulsion film. It is then a very simple matter to treat the whole negative by a stripping process such as that the formula for which is given in the "Almanac." After treatment with the hydrofluoric mixture, each narrow band of film containing a single title can be readily raised, detached, and transferred to the view negative. Before applying the title strip to the latter it is usual to cut out a strip of the emulsion film with a sharp penknife so as to provide a clear space for the reception of the strip bearing the title. This bared glass is painted over with a little weak gum solution, to secure the adhesion of the title film. This having been applied and left to dry, the negative is then ready for masking, the customary method for which is first to mark off the subjects in Indian ink with a drawing pen and straight-edge. The further blocking-out is then done with any good mixture, such as Vanguard "Photopake," in applying which the opaque is taken up as close as convenient to the transferred letters. This method of masking the negative and of inserting the title just outside the outline of the mask gives a much better effect than any attempt to introduce the title upon a portion of the negative representing part of the subject itself. It presupposes, of course, that a negative of half-plate size is available, although at a pinch it is applicable also to those of postcards ($5\frac{1}{2}$ x $3\frac{1}{2}$ size).

If, on the other hand, the photographer wishes to avoid the trouble of this masking, which certainly imposes a considerable degree of accuracy in printing the cards in order to obtain a uniformly wide white margin round the picture, the strip method may equally be employed, although it is then usually preferable to use not the original title negative, but a positive printed from it on to another process plate. This gives, of course, black letters on a clear ground, and usually in most landscape subjects a place can be found for it where it will print satisfactorily, or if the negative is one which is unsuitable in this respect the use of a little strong Farmer's reducer or iodine-cyanide mixture on a fine camel-hair brush will provide the requisite clear space in the landscape negative.

The above, or, rather, the form first described, is the method generally adopted by publishers of view postcards on the large commercial scale, although variations of it, in some cases altogether non-photographic, have been employed. For example, Mr. G. T. Harris, of Sidmouth, himself a publisher of view postcards on a considerable scale, described at length, some years ago, in these pages ("B.J.," April 19, 1912) a variation of the process in which the titles are set up in type, impressions taken directly from them in a small printing press, and fine electrotyper's plumbago immediately dusted over in order to give greater opacity to the ink impression. This is a method, of course, for insertion of the title upon the subject portion of the view negative, the letters printing in white against the dark or medium tone of the photograph.

Postcards of the Carpentier-Beckett Fight.—Messrs. Lilywhite, Ltd., Dunkirk Mills, West End, Halifax, send us a complete sample set of their postcard reproductions (from "Daily Mirror" photographs) of the recent famous boxing event. The series includes twenty-four cards, which, taken altogether, form a very effective record of the short and rapid phases of the fight. Messrs. Lilywhite seem to have received a measure of inspiration from Carpentier's rapid action, for they point out that they have beaten all their own records in rapid production by producing 24,000 of the cards between the receipt of the negatives on December 11 and the morning of Sunday, December 14. By the end of the present week they will have about a quarter of a million of the cards ready for despatch.

ENLARGING AND REDUCING IN TRUE-TO-SCALE PROCESSES.

Although the term "true-to-scale" usually is employed to denote one particular method of reproducing line drawings, tracings, plans, etc., that known as the Ordoverax process, there are other printing methods in quite general use to which the definition of true to scale can be applied with at least equal veracity. In the case of engineers' or architects' tracings, as well as in the reproduction of maps, it is perfectly obvious that the accuracy of the scale in any copy is absolutely essential, so that measurements may be read off in any desired detail just as correctly as in the original drawing.

The Ordoverax process referred to comprises first the making of a ferro-prussiate print from the tracing, laying this blue-print (without any washing) down on to a prepared gelatine surface and pulling it off again, whereupon the jelly is rolled up with greasy ink. The latter adheres to the lines, and pulls are made on plain paper. The latter is necessarily of fairly stout substance, and the moisture absorbed from the gelatine is seldom sufficient to cause it to expand to any appreciable extent, so that the pulls are reasonably identical with the original. It is pretty obvious, however, that it is not a process which lends itself to the production of copies on any other scale than that of the original; but it is not a very difficult matter, as I propose to show, to make an accurately enlarged or reduced copy of the original tracing, from which the process can be carried on almost in the usual way.

In addition to this process there are two other printing processes, worked by lithographers, which are just as much entitled to be described as true to scale, and have this advantage: that, whereas the jelly process will give only small editions up to fifty from one blue-print, the litho. plate made on zinc will yield thousands, and is, in fact, much used in the printing of maps, in which work accurate scale is absolutely a *sine qua non*. The first of these two processes is that known as "Vandyke," in which the sensitised zinc is printed in contact with the original tracing or drawing in a box pressure-frame, and is subsequently washed and inked up, when it is ready for the litho. printer. This process can be worked from drawings on quite thick paper provided that the lines are opaque and that a long exposure to daylight can be given. The making of a plate to a different scale from that of the original may frequently be desirable, and I shall show how this may be done without loss of accuracy in the same manner as for the ferro-prussiate process.

The other method referred to is that in which the zinc plate is printed in contact with a reversed line negative, just as in block-making, but etched and inked up to suit the litho. printer. Obviously the negative can be made to any desired scale. To obtain a standard of great precision in copying in the camera appears to have been left entirely to methods of trial-and-error and rule-of-thumb, even in establishments where one would expect nothing short of the very finest possible work. After some experiment I have succeeded in evolving a method of measuring the image on the ground-glass with ease. The plan involves a little trouble to start with, but once fixed up there is nothing at all to go wrong, and the correct adjustment of the camera becomes almost child's play. What calculation there is is very elementary arithmetic indeed, and has nothing to do with such factors as the focal length of the lens or ratio of enlargement or reduction. I have found these factors more often than not to contain a fraction which only confuses and complicates matters. The average operator appears to hate anything in the nature of calculations, and although it has not been possible to eliminate this feature altogether, it has been reduced to absurdly small dimensions. I have ruled out methods involving the calibration of the base-board calculated on the focus of the lens, partly for the reason suggested above, and partly because it is impracticable to work on that idea unless one knows the focal length of the lens to a very minute degree of accuracy, besides which a fresh table has to be worked out for each instrument. The method described below will work with any camera or lens at any time, and cannot be affected in its accuracy by such a cause as shrinkage or expansion of the original under climatic conditions, or by the use of colour filters, features that render tabulated methods useless.

Bromide or Gaslight Print as Original.

To take the former processes first, that is those printed from the positive tracing, it is not generally known that a bromide print reproduced in any size can be printed from with almost the same ease as the original drawing. There are, however, certain difficulties involved in the production of a suitable print. The bromide paper is fairly opaque, of course, and requires long exposure, but this can be much

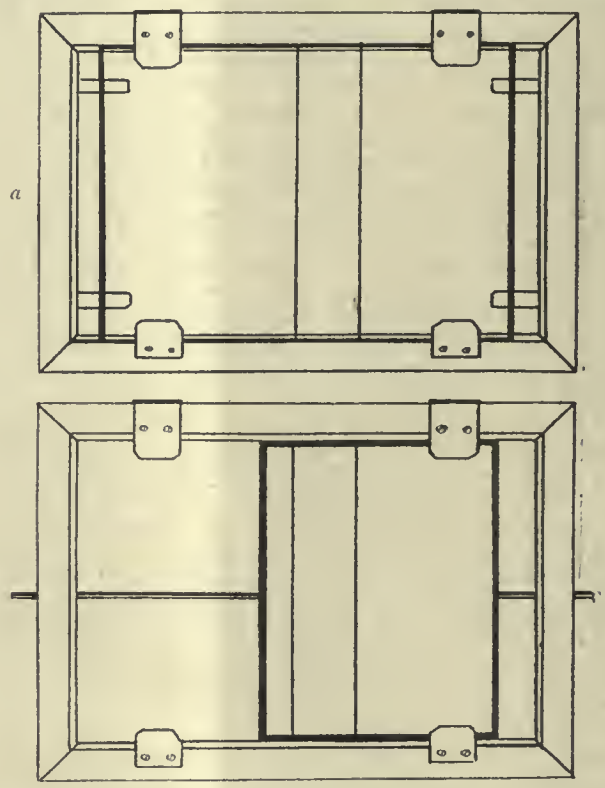


Fig. 1.

shortened by rubbing castor or linseed oil or even turps into the paper. The image being purely line work, the grain of the paper is of no account; semi-matt paper usually is more translucent than other surfaces. Another supposed objection is the wetting and drying that a bromide print necessarily receives in its production, and is thought unavoidably to introduce alteration in size. I have found, however, that if sensitive paper is well dried by leaving in a warm place for a time before exposure, and subsequently thoroughly desiccated in the same manner when the print has been made, there will be no difference that can matter in any but the very finest work, and it is scarcely probable that this method would ever be used for work of such a critically fine character. The bromide print is made from a negative

which is copied in the camera, of course, either by enlarging or contact, according to circumstances. In enlarging, however, a line subject will thicken up almost always considerably on bromide paper when the lines are developed sufficiently dense for the purpose. So much so, in fact, that fine detail may become obscured. Even the "Press" variety of bromide paper is liable to this fault, and it is much better to make the negative quite thin, making sure that the lines are quite perfectly clear, and enlarge on to gaslight paper. This not only has the property of retaining the lines absolutely sharp even when considerably over-exposed, but actually gives a much denser deposit of black image than bromide paper will. Of course, both in copying and in enlarging, care must be taken that the apparatus is properly set up, or if all the parts are not absolutely parallel or perpendicular to one another, as the case may be, some portions of the subject may be found very much out of scale in the final result, although the detail focussed on will be correct.

Perhaps an example will make clear the procedure. Supposing the tracings or working drawings of a machine are required to be reproduced on a smaller scale than that of the originals, say one-half or less in order that prints of a less unwieldy size may be issued for general use. Obviously, it is a far quicker thing for a photographer to make a negative and a print or enlargement from it than for a draughtsman to set out the detail all over again to accurate measurements. Even if the draughtsman is called on to do the work, he can much more easily and quickly draw on a sheet of tracing-cloth laid over a photographic print. This latter method was very largely used during the war for rapid reproduction of maps in various sizes. The negative can be made to any convenient size, and accurate measurements taken on the enlarging easel. Any measuring in this method should be made over as long a line as possible rather than by any particular detail. That is to say, that even when the scale is marked, as it usually is, on the original, it is preferable to take the distance between two prominent points diagonally across the subject as a basis for measurements in order to minimise inaccuracies

The resulting enlargement can be used either as a guide for the draughtsman or, after a little touching up here and there, as the medium for producing a blue-print for the Ordoverax process, or for making a zinc litho. plate by the Vandyke process.

Making Reversed Negatives: Three Methods.

It is, however, the method of making a negative from which to print a litho. plate that is depended on for the finest and most accurate work. Either a reversed or non-reversed negative can be used. In the latter case the image on the zinc has to be transferred and reversed, and this is seldom done without some loss of detail, which has to be made good by the litho. draughtsman, and I believe transferring tends to thicken the lines slightly, so that it is highly desirable to employ a reversed negative. There are three methods of making these. The first is to reverse the process plate in the dark-slide and the ground-glass in its frame (or make the necessary adjustment after focussing for the thickness of the plate). I do not recommend this method at all, though it has been used fairly successfully at a pinch. Unless the original to be reproduced is of the easiest possible nature, such as bold black lines on the whitest of Bristol board, it is best left alone. The objection to it is that copies from tracings and similar poor originals usually need clearing and intensifying (I am referring to dry-plate work), and by the very nature of the method any veil that may be on the lines will be next the glass, where the reducer will hardly reach it, and on intensifying the lines are found to clog up badly. Another factor to which I attribute the failure of this frequently recommended but very unsatisfactory plan is the reflection and re-reflection of light between the film and the front surface of the glass. This form of halation is usually sufficient to veil the lines long before the ground has attained sufficient density, and matters are still further complicated by the unevenness of the emulsion on the plate preventing even action of the various solutions. This might be thought a negligible factor in line work, but it happens that its results, in the form of lines showing up thicker or thinner in various portions than they should be, are more noticeable than in almost any other branch of photography. I may seem to have dwelt on this matter rather more than its importance deserves, but I think it a good opportunity to try and kill the idea that to reverse the plate in the slide is a simple, quick, and easy mode of producing a reversed negative. It sounds like it, and that's all.

The second method is to copy through a prism. Obviously this is the best plan, but is possible only where a proper process camera is installed, and reversed negatives are produced as easily and as quickly as direct ones.

The third plan has been found in practice to work splendidly. It consists in making an Ordoverax print from the original tracing, but with this deviation: that, whereas ordinarily the necessary blue-print is made through the *back* of the tracing, this time the ferro-prussiate paper is printed in contact with the actual pen work. The result is a print in sharp black lines on white paper, but reversed as compared with the original tracing. This forms a very easy subject for copying *direct* in the camera on either process or wet-plate with a reversed negative as the result.

Alternative to Making a Reversed Negative.

Where neither of the two latter methods is practicable, by reason of the photographer not having access to either a process camera or an Ordoverax installation, I do not recommend the trial of the first method, i.e., reversal of the plate in the dark-slide, for reasons already sufficiently fully enlarged upon, but in place of that to make a direct (i.e., unreversed) negative, from which a glass or paper positive is printed by contact, and the latter printed on to the zinc by the Vandyke process.

A paper positive can be made, as previously described, by thoroughly drying a sheet of gaslight paper before printing it, and subsequently drying it in as nearly as possible similar conditions before printing on to the zinc. Naturally a glass positive is preferable for the very finest detail and extreme accuracy, and should be used in all cases where size does not make the cost prohibitive. The glass positive is made on a process or a special lantern plate behind the negative in a screw pressure frame, and exposed to a very small source of light held quite still at a fair distance away. The light of a match is usually enough. The emulsion side of plates is usually slightly saucer-shaped, and good contact consequently hard to secure, so that a diffused or moving source of light may weaken the finer lines.

I should like to emphasise at this point the necessity in this branch of highly-skilled photography for absolute accuracy in the construction and adjustment of the various parts of the copying installation. If the apparatus is not substantially and correctly put together the cleverest operator cannot always produce flawless results. It is neither a long nor a difficult job to test any installation as regards the rectangularity and parallelism of its parts, but it is often a matter calling for much care and patience to correct any faults that may be found.

Having now dealt fairly exhaustively with the various methods of reproducing line subjects in general use, as well as one or two variations which I believe to be very little known, I propose to describe my method of obtaining absolutely accurate scale in copies made in the camera with the greatest possible ease.

Measuring the Image on the Ground-glass.

Anyone who has ever tried measuring the image on the focussing-screen with a foot-rule knows the slow job it is, and the surprisingly great errors in results made possible by the thickness of glass between rule and image, as well as by the difficulty of keeping the end of the rule on any given point. The movement of the image during focussing adds materially to this inconvenience. The plan to be described is adaptable to any form of camera for dry or wet-plate, and involves no expense beyond a little time and careful work. All the constructional work required is some means of sliding the ground-glass laterally for a small distance, say a quarter to half an inch, or else to make a device by which a piece of glass or sheet celluloid will slide laterally in contact with the ground surface, to be workable from outside the camera.

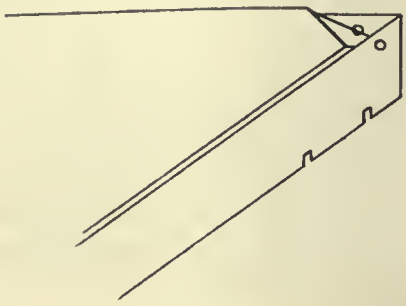


Fig. 2.

Neither of these is needed in the case of a process camera possessing a rising or cross-front actuated from behind so that the moving image is observable on the ground-glass. There is nothing difficult about making the ground-glass to slide. The lateral movement may be introduced simply by cutting a narrow strip off one end of the glass, and, if necessary, fixing small pieces of wood or metal to support the open edges and prevent breakages (fig. 1a). Alternatively the rebate in which the ground-glass lies may be cut wider to allow of the sliding movement or the whole focussing-frame

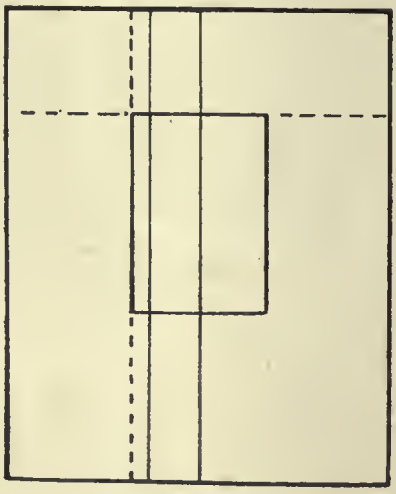


Fig. 3.

may be arranged to move in some cases. Where this is not convenient, a fitting on the lines shown in figs. 1b and 2 can be very easily fitted. Fig. 2 shows a narrow metal frame to take a piece of glass which is fixed in position with its surface slightly raised above the edge by the simple expedient of bevelling the corners and making nicks in the metal, as shown in the diagram. Bevelling the glass is done by means of a file under water, and takes a few seconds only.

A pair of very fine lines is drawn on the ground-glass in the one case or on the sliding piece in the other, exactly vertical and 2 ins. apart. The left-hand line is to be as near as may be to the centre of the ground-glass and the other 2 ins. to the right of it. Refer again to fig. 1. The essential points of this detail are the absolute parallelism of these two lines to the edge of the ground-glass, their fineness and exact distance apart, and the ability to move this two-inch column from side to side very slightly. The only variation is in the case of a camera having a rising-front (but not a cross-front) operated from behind. In this case the lines should be horizontal instead of vertical, but the ground-glass may be fixed, as adjustment is effected by working the rising front. Before proceeding with the subject it is necessary to show how these parallel lines can be fixed to a very minute degree of accuracy, this not being so simple in small sizes as in large ones. In fig. 3 a small focussing screen is shown temporarily stuck to the centre of a larger sheet of paper or card, on which a line is drawn producing one edge of the glass and others at right-angles and parallel to it, marking the two-inch column. By working over a greater area, the degree of inaccuracy at the edges is reduced to an infinitely minute amount towards the centre. The lines themselves may be drawn or may consist of fine silk or wire stretched across, and fixed here and there with a spot of fish-glue or shellac solution.

The only other detail required is a rule accurately graduated to be affixed to the easel. A paper one can be permanently glued on or a wooden or ivory one may be let in flush with the front surface of the copy-board. A rule of exceptionally fine graduations is not at all essential to the method. A vertical line is drawn on the easel as near the centre as possible so that its image will fairly coincide with the centre line on the focussing screen. There should be no difficulty about this, and the easiest way is to stretch a piece of white cotton on the board and to focus it up. It is quite essential that the image of the cotton should coincide with the ruled line through all its length. The rule is to be fixed somewhere about the middle of the board, at right-angles to the line of the white thread, with zero right on the line and the graduations lying to the left, obviously upside down (fig. 4).

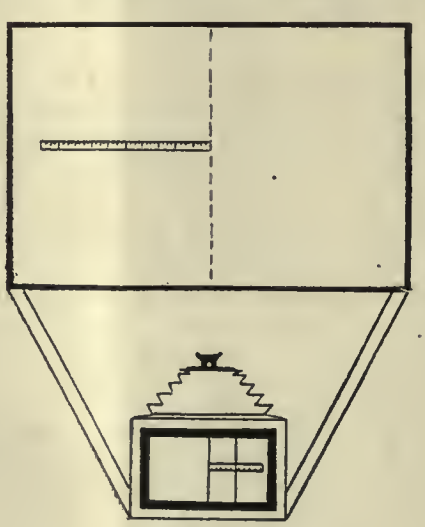


Fig. 4.

A little special care should be taken to follow out these details, for, once fixed, they need never be repeated, and it is a thing that if not done properly had far better not be done at all. If the procedure described has been followed the image of the rule will always be seen on the right-hand side of the ground-glass. It is the matter of an instant to slide the latter,

or the movable device, as the case may be, so that the left-hand line falls on zero of the rule image, and to observe the figure that the right-hand line cuts. Thus it becomes possible instantly to measure the image of the rule by the two-inch column on the ground-glass, and in focussing to get any desired length of rule image in that space. It is only required to remember how to find the amount of the image of the rule on the easel to be included in the two-inch space on the ground-glass. Even this need not be memorised, but can be typed out and fixed on the wall for instant reference. The formula is:—

Where D = Dimension of Original.
R = " " Result required.

$$2\frac{D}{R} = \text{Length of rule to be copied to } 2''$$

Example: A plan drawn 1 in. to the foot is required 1 in. to the yard. Three inches on the original is required to be 1 in. on the copy so $2 \times \frac{3}{1} = 6$. Six inches on the rule is to go into the two-inch space on the ground-glass. This is an absurdly simple example, but so is the whole method once installed. If the original happens to be incorrect by reason of expansion due to damp or for any other reason this can be corrected in copying by adhering strictly to the above formula. When the camera has been adjusted and focussed in the manner described the original can be pinned up with the certainty that it will be sharp and to correct scale, without any further alteration to the camera. Some operators will be tempted to make a "final focussing" on the actual subject to be copied, but this will do nothing more than upset the accuracy of the scale, and is therefore to be deprecated as worse than useless.

D. Charles.

PRACTICUS IN THE STUDIO.

[Previous articles of this series, in which the aim of the writer is to communicate items of a long experience in studio portraiture, have appeared weekly since the beginning of the present year. It is not thought possible to continue the series to the length of that by the same writer which ran through the "British Journal" some years ago, but if any reader among the younger generation of photographers, and particularly those engaged as assistants, has a particular subject which might be dealt with, his or her suggestion will be welcomed. The subjects of the previous articles of the series have been as follows:—

A Talk About Lighting (Jan. 3).
The Camera and the Lens (Jan. 10).
Managing the Sitter (Jan. 17).
Backgrounds (Jan. 24).
Studio Exposures (Jan. 31).
Artificial Lighting (Feb. 7).
Printing Processes for Portraiture (Feb. 14).
Studio Accessories and Furniture (Feb. 21).
The Surroundings of the Studio (Feb. 28).
Studio Heating and Ventilation (March 7).
The Postcard Studio (March 14).
The Printing-Room (March 21).
About the Reception Room (March 28).
Home Portraiture (April 4).
Portable Studios (April 11).
Copying (April 18).
Handling the Studio Camera (April 25).
More About Lenses (May 2).
Enlargements (May 9).
Advertising the Studio (May 16).
Mounts and Mounting (May 23).
Business Methods (May 30).
Photographing Children (June 6).
Portraits of Elderly People (June 13).
Something about Lenses (June 20).
Hand Cameras for Professionals (June 27).
The Dark-Room and Its Fittings (July 4).
Plates and Their Work (July 11).
Apparatus Repairs and Renovations (July 18).
Posing the Head (July 25).
Intensifying Portrait Negatives (Aug. 1).
Workshop Jobs (August 8).
The Personal Factor (Aug. 15).
The Keeping of Negatives (Aug. 22).
Reduction of Negatives and Prints (Aug. 29.)
Leaky Roofs (Sept. 5).
Blinds and Curtains (Sept. 12).
Miniatures (Sept. 19).
Printing Portrait Negatives (Sept. 26).
Wedding Groups (Oct. 3).
Combination Printing (Oct. 10).
Flashlight Work (Oct. 17).
Flashlight Portraiture (Oct. 24).
The Question of Outfit (Oct. 31).
Telephoto Lenses for Professional Work (Nov. 7).
Changing Quarters (Nov. 14).
CarbonPrinting—I. (Nov. 21).
Carbon Printing—II. (Nov. 28).
Bromide Wrinkles (Dec. 5).
Natural Poses of the Figure (Dec. 12).

THE REPRODUCTION OF NEGATIVES.

For a variety of reasons the necessity occasionally arises to reproduce negatives either in their original size or upon an enlarged or reduced scale. It may be that a negative of a celebrity or of a unique ceremony may be deemed of such value that it is desired to keep it as a "master" record and to print from the reproductions only, or a negative may be too thin or too dense to yield good prints, and it may be deemed too risky to submit it to the ordinary processes of intensification or reduction; or, again, it may be so stained or damaged that perfect copies cannot be printed in the ordinary way. Besides this, a separate negative of a portion only of the subject is needed, or enlarged or reduced sizes wanted for carbon or platinum printing. As we can control the contrast and density at two stages, the transparency and the negative from it, it is often possible to obtain results vastly superior to the original.

There are many ways of effecting our purpose, but I propose only to deal fully with that which most photographers will find most convenient, which is the making of as perfect as possible a transparency, and from that the negative. The character of the original will largely affect the selection of the plates used for the purpose, as it may be necessary to modify the result considerably, and I therefore detail the kind of plates necessary to do this effectively, at the same time remarking that with average negatives any good brand of ordinary speed or slow plate may be used throughout.

For very thin negatives "process" plates will give the best results, as it is easy with these to obtain in the transparency considerably more contrast than there is in the original. Moreover, they are more amenable to intensification than ordinary plates, and there is very little risk of fogging.

Dense thick negatives, on the other hand, call for a more delicate film; special transparency plates coated with the emulsion used for lantern plates will be found to give the necessary delicacy of image. Failing these, an "ordinary" or "fine grain" plate will answer very well. Those who work carbon will find the special transparency tissue very suitable, as very thin delicate prints may be made upon a glass support, and if necessary these may be strengthened by staining or dyeing, or

even by intensification with pyro and silver solution. If the negative is to be made of a larger size than the transparency, the absence of grain in the carbon image renders it particularly suitable.

As a general rule I prefer to use a non-staining developer such as metol-hydroquinone, amidol, or Azol for the transparency. The same developers or pyro-soda may be used for the negative at the operator's discretion.

The exposure for the transparency may either be by contact or in the camera. For dense negatives the first is, as a rule, most satisfactory, while for thin ones the camera method is preferable. When making contact transparencies we must be careful to avoid parallax, which will destroy the sharpness in such areas as are not in actual contact. Modern negative glass is rarely quite flat, and as it is usually coated on the concave side it is possible to have the negative and sensitive plate touching at the corners only. Therefore it is necessary to have enough pressure to secure moderately good contact all over, and for this a frame with a plate-glass front and strong springs is necessary. With very fine diagram subjects I have even had to use a process frame with ⅜-in. plate-glass and screw pressure to avoid a spreading of the lines. In any case the printing frame should be kept quite still during the exposure, which should be made as far as convenient from an illuminant which is small in area. To give an example, I would give a distance of 5 ft. or 6 ft. from an unscreened inverted gas-burner, while with very thin negatives even a greater distance is recommended. The exposure should be long enough to yield an image which shows little if any clear glass. Lantern-slide quality is too hard, and will give harsh results. When using the camera the negative should be illuminated by a white cardboard reflector, and care must be taken to avoid shadows upon this, or the transparencies will be uneven in density. I frequently make both transparency and negative with an ordinary enlarging lantern, fixing up the plates on the easel, under the heads of small drawing-pins. As a rule, one or two thicknesses of ground glass should be interposed between the light and the condenser, except with very thin negatives, when a strong light and the full aperture of the lens will tend to give softness.

At this stage we may do much to even up our image either by locally shading the negative during contact printing or in the camera, or by shading the image in the way usual with bromide enlargements when the lantern is used. If a cracked or broken negative has to be dealt with, it should be printed by contact and kept in motion in a circular direction meanwhile. In this case we must risk parallax to avoid a greater evil. If such cracked negatives are very thin, they may be exposed through one or two thicknesses of white blotting-paper placed outside the frame, as this greatly reduces the effect of the edges of the crack.

Having obtained our transparency, we may proceed to intensify or reduce it, either all over or locally, and when dry to retouch or work it up till it is as perfect as possible. On a transparency we have the power of strengthening shadows as we do lights in a negative, so that "knifing" is not absolutely necessary.

The exposure of the negative plate may usually be by contact unless the size has to be varied, when the camera or lantern may be used in the way already described.

If the transparency is still lacking in strength a process plate may be used and intensified in turn; by this treatment quite a vigorous negative may be obtained from a mere ghost of an original. In no case do I recommend the use of very rapid plates for reproduction work, as not only is the grain coarser, but there is not the latitude in exposure and amenability to variations in development found in a slower plate.

If reversed negatives are required, either the transparency or the negative must be made in the camera, the film side of the original being turned away from the lens. A simpler way by contact is to use a Portrait Film for one or the other exposure, putting the back of the film in contact with the film or the plate; as a matter of fact, with ordinary subjects either side of a film negative may be printed from without perceptible loss of sharpness.

The simplest way to reproduce a negative is to copy a print, and this is extensively done in many establishments. There is, however, usually a noticeable loss of quality when bromide or platinum prints are used, and I much prefer to work from a rather lightly printed P.O.P. copy, which is put under pressure in a plate-glass printing frame and copied *without toning or fixing*. With care the exposure may be made by daylight if all preparations are made before uncovering the print, but a better plan is to expose by ordinary metallic-filament lamps or even incandescent gas light, which have practically no effect on the sensitive paper.

Several processes have been published by which a negative can be produced direct from another negative, but they can hardly be said to be adapted for everyday use. If a plate be greatly over-exposed, a reversed image is produced, but usually of a foggy character. Sensitising an ordinary dry plate in bichromate, and printing until the image is visible at the back and then developing and fixing, will produce a negative from a negative, the exposed parts having become insoluble and impermeable to the developer which acts upon the remainder of the film.

The "dusting on" or powder process will give excellent results by a single operation, but the manipulations required are too delicate for the average photographer. All the foregoing "direct" processes yield reversed negatives, which are only needed for single transfer carbon and certain photomechanical processes.

PRACTICUS.

A SMALL FINISHING PLANT.

[The following article is quoted from our San Franciscan contemporary, "Camera Craft," for its very full description of the outfit used for "photo-finishing," as the development and printing of amateurs' film exposures is called in the United States.—Eds. "B. J."]

WORKING in a few finishing shops, visiting a number of large plants in the East and Middle West, including the Eastman model plant and running a small shop of my own, may, I trust, justify my presumption in offering a few suggestions on the developing and printing of amateurs' film negatives. The methods advocated may, in some cases, vary from the makers' instructions, but such departures have been found either to save money in original cost or economise time getting out the work.

When the work comes in, the first thing to do is to get it booked. The simplest and most accurate method of handling up to three hundred rolls a day is to enter the orders in a cheap day book. A serial number is given each order, and the entry is made like this:—

718
Mrs. John Jones, Jonesville, Wis.
1—116—6
1 *ea.* (meaning one print of each good).

In the case of an agency or other large customer the name only can be stamped in with a rubber stamp. The next line of

the entry shows the number of rolls and size, while the last shows just what work is to be done. Start the numbering with 1 each week, in order to keep it low. At the same time that the order is booked the number is placed on the roll or rolls.

When a tank full of films have accumulated, develop them. Placing the films on a small shelf, with a ruby light in front of you, the numbers can be seen on the roll. Repeat them on the film, using a blue "glass-marking" pencil. Ordinary lead will stick, but this kind of pencil is better, and rarely rubs off. The pencil has the advantage over scratching or punching methods in that the number can be easily erased when it accidently overlaps on the picture, as it sometimes does.

After the films are marked and stripped, they are doubled back, face out, and the ends fastened with a Kodak, Jr., clip. In the case of small films, No. 2 Brownies, etc., two films can be placed back to back, with a clip on each end. The film-holder is hung up by the hooked handle before work is begun, and as each film is stripped it is hung upon one of the rods in the hanger. Several can be placed on each rod. Film packs can be handled best by the use of Premo back-hangers; but though these can be developed along with the roll films, it is best to handle them separately, as they require about 50 per cent. longer development. Plates can be handled easily by using a plate tank-rack on the end of a strong cord that permits it being lowered to the bottom of the tank out of the way of the roll films.

The best developing equipment that I have ever seen, using tanks smaller than the 48-gallon stone ones recommended by the Eastman Company, is one employing sewer-pipe tanks. The vitrified clay sewer-pipes are absolutely acid, alkali, and water-proof. And they are cheap, compared with wood or copper. Obtain four sections of this pipe, each 4 ft. long and of a diameter suited to your needs. I used 10-in. pipe for a while, handling about thirty rolls at a time. Build a platform of 2-in. plank, about 6 ins. from the floor, and make it wide enough to hold the pipe, and place the sections, flange-end up, on this platform.

If drain-pipes are wanted, the next thing to do is to arrange them in place These, with the necessary elbows, valves, and other fittings, should be so placed that the ends of the pipes extend through the board into the bottom of each tile section with the valve-handles between the platform and floor, where they can be reached easily. Allow the upper end of these drain-pipes to project about 2 ins. above the plank, inside the tiles. When they are arranged to your satisfaction, pour about 2 ins. of concrete, half sand and half cement, into the bottom of each tile and allow to harden. Some rags stuffed into the ends of the drain-pipes will protect them from concrete that might flow in. When the concrete has set, pour enough real hot paraffin into the bottom of each tank to coat and protect the concrete thoroughly. If you do it quickly you can drain the surplus out through the drain-pipe, and thus give a coating to the interior—i.e., that part above the valve that will be exposed to the chemicals.

If your climate demands it, a water-jacket for cooling the contents can be built around the developing tank. A cylinder made of galvanised iron—one slightly larger than the sewer-pipe—can be set around the tank. This should first be coated with Probus paint, except for an inch or so at the bottom, inside; then placed in position, and 2 ins. or 3 ins. of concrete poured in. The water-jacket is then on the developing tank for life.

Have the tinner make two or three film hangers, shown beneath printer in the drawing, the size being determined by the inside diameter of your tanks. Make them from 10-gauge iron wire, and have at least an inch between the spoke-rods at the edge of the 4-in. metal centre. Have the ends of each rod turned up about one-half inch, in order to prevent the films slipping off. The upright hook in the centre, for hanging up while filling, should be at least 6 ins. long. When the holder is completed, give it one or two coats of Probus, and keep the metal coated at all times in order to prevent staining of the films. A circular tin cover with a tight-fitting flange will protect the developer from the air, and greatly reduce oxidation. This should also be coated with Probus paint.

I have had very satisfactory results, using a small tank, with a twenty-minute developer, made as follows:—

Water	128 ozs.
Kathol	½ oz.
Hydroquinone	¾ ,,
Sodium carbonate	3 ozs.
Sodium sulphite	5 ,,
Potassium metabisulphite	80 grs.
Potassium bromide	25 ,,
Sodium hydrate	65 ,,

Add water to make 640 ozs. This developer gives fine contrast suitable for amateur work; is non-staining, oxidises very slowly, and will develop more films than any I have used.

While the films are being developed the envelopes can be made out, using the order book and making a check mark opposite each entry to show that this has been done. The envelopes should bear the film order number and customer's name.

The second tank is used for rinsing tank; and, while the washing tank can be used for this purpose, it will double the capacity of your tank system to use a fourth tank also for rinsing. The hypo is mixed according to the standard acid-hypo formula, though, in the cooler seasons, very little hardener is necessary. Theoretically, the amount of silver which could be recovered from a tank full of exhausted hypo would be worth some trouble: the fact that the tanks must be used every day, and the silver has to be precipitated as a sulphide, makes me doubt the advisability of bothering with it.

Strong spring clothespins, stretched on a wire or light rope make a convenient arrangement for drying. The wet and slippery end of the film may slide out, and it is therefore advisable to drive a couple of small tacks through the end of each clothespin, thus forming a puncturing point that will hold the heaviest film. The average finisher thinks that a drying cabinet is almost a necessity. It isn't. If one will fix his drying line, either at or near the ceiling or so arranged that it can be raised there, the warm air at the top of an ordinary store or room will usually dry films in an hour or two.

After the films are dry, check them against the original entry. On the end of the film, near the number, write the instructions with a pencil; 1 ea., 2 ea. D. O. (develop only), or whatever they may be. At the same time sort the films according to size, thus saving a good deal of time in printing. The films are taken to the printing room without cutting up.

Two printers rank first for amateur finishing work, in my estimation. One of these is the Pa-Ko printer, which though not inexpensive comes closer to being an ideal printer than anything else on the market. Plenty of lubricating oil, and some rubber attached to such points of shock as the lever operating the pressure board, will help a lot. The other is a home-made printer that can be constructed for less than five dollars. The drawings herewith show the details. No measurements are given, as the individual worker will vary the size to suit himself. The top, which should slope slightly towards the operator, has a 7 x 5 glass fitted into the top, so as to leave a smooth surface. A nitrogen bulb in a circular reflector furnishes the printing light; while a small ruby bulb gives the illumination necessary for adjusting the mask and negative, as well as for judging the density and contrast. A strip of wood, ½ in. thick and 2 ins. wide, hinged to the right hand front leg near the bottom, controls the lights by a sideward movement of the knee. In place of the usual hinged pressure board, use a block of inch wood, about 6 x 4,

with a sheet of felt over the under side. In the centre of this cut a hole to accommodate an ordinary self-inking rubber stamp. The metal legs should be cut off so that they cannot come in contact with the paper and negative. This stamp is fitted into the centre opening and screwed to the block so that the numbers will just come in contact with the paper. The felt covering on the bottom of the block is, of course, cut away where the stamp operates.

The masks may be home-made, but I have found the Eastman transparent masks, with trimming guides, easier to adjust, and the guides made it possible for a girl to trim prints faster and more accurately. In any case, a mask for each size used is fastened to a separate piece of 7 x 5 glass, a wide rubber band around the mask and glass holding the uncut film in place.

Thus equipped, the paper can be adjusted very quickly and the numbering pressure block held down upon it, a movement of the knee switches on the printing light at the same time. The big advantage of this type of printer lies in there being, practically, no weight to move. The numbering stamp, being built into the pressure pad, numbers the print while the exposure is being made. A quick-drying rubber-stamp ink should be used, and used sparingly, to avoid any blurring of the number or soiling of the next print. There is little to get out of order with this printer. The operator is not tired with a heavy pressure board that must be raised and lowered, and the number cannot be left off a print through accident.

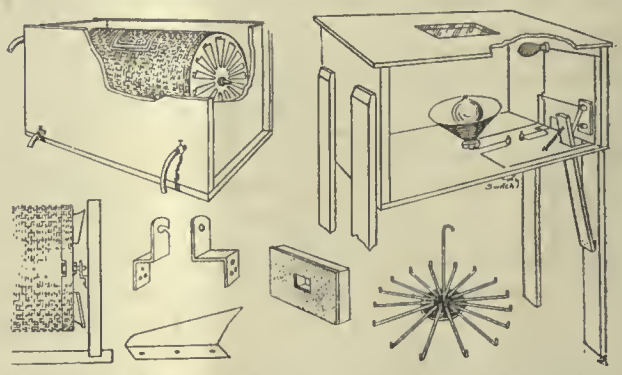
A small strip of yellow celluloid will enable you to mask off the fogged or short end of a negative. The same number that is on the film can be used on the print, but it is much easier to begin every morning with a new print number, the first order printed each day bearing the number 1, the second 2, and so on, this saving time in setting the stamp. The number should, in all cases, be stamped on the end of the film. If there is no paper remaining there, a small sticker can be attached to take this stamped order number. An initial or key number will show, where there is more than one printer, which one made the print, and such a number will also simplify the sorting.

In my own work I use both Azo and Cyko paper. The former has the advantage in price, and is used by many finishers. Of the latter, I use Studio Surface, in the three regular grades, and some "Professional" for very blocky negatives. Two sizes are enough, and their use simplifies matters. Use 6 x 4, full size, for postcard stuff, and cut it in two for $3\frac{1}{4}$ x $2\frac{1}{2}$. Use 7 x 5, cut in two, for $4\frac{1}{4}$ x $3\frac{1}{4}$ and $4\frac{1}{4}$ x $2\frac{1}{2}$. Cut in quarters, it makes a good size for "vest pockets" and smaller. In using Cyko it really saves time and trouble to buy the 500-sheet boxes of amateur finishing size paper. By the use of paper guides on the printing masks the prints can be made with even margins on two sides and thus decrease the trimming, but personally I prefer to turn out prints trimmed on all four sides. The edges of any print pick up dirt, show abrasion, and the corners show some damage in the washer.

Iron baking-trays, painted with Probus, make good trays for the acetic acid short stop and acid fixing-bath. Be sure and keep both of these fresh and strong. Nothing is more depressing than having a lot of stained prints to make over, particularly during the rush season. A big wooden spoon makes a good paddle for the short stop and hypo. An electric light, white, fitted in the bottom of a 1-lb. soda can and hung a foot or so above the hypo tray, will enable you to see the real tone, depth, and quality of the prints. The makers' formulæ should be used for all paper development.

For washing small-sized prints there is nothing that will beat a rotary washer, and a good one can be made as follows: Take a piece of 1-in. hardwood and cut two circles, 10 ins. in diameter, to be used for ends. With these make a cylinder of $\frac{1}{4}$-in. mesh galvanised screening, 20 ins. long, with a hinged door, made out of the same material, in the side. Place a bolt in the centre of each end-piece for an axle, and supply one of these end-pieces with small galvanised iron paddles, arranged as on a water-wheel or water-motor. This circular cage is then mounted in a tank so that its top will just come above the water level. The water inlet, directed against the paddle-wheel end, causes the cage to revolve and keep the prints separated and in motion. The overflow outlet is at the top, and the drain-pipe in the bottom can be used to prevent hypo-laden water from settling there, as well as for drawing off the water for easy removal of the prints. The diagram should make all clear. Notice that the head of the bolts used as axles are sunk into the wooden ends so that they will not catch and tear the prints. The two bearings on which these axles revolve are shown in the drawing, the form of the hole in the one at the left permitting of the revolving part being removed for cleaning if necessary. One of the galvanised paddles or vanes is also shown below. Fifteen to thirty minutes in such a washer as this eliminates all hypo. from the prints, or you might buy one of the excellent Rex washers, made by the Northern Photo. Supply Company, of Minneapolis.

Formerly I dried my prints on a stretcher; but, finding that



Printing-box, washer, etc., used in the making of prints from amateurs' film negatives.

they curled too much and dried too slowly, I bought a blotting-paper and corrugated board drying roll, such as the Eastman Company supply for their Majestic drier, costing about three dollars. Rolled up in one of these, the prints dry about as fast without heat as they do on a stretcher. Set over a hot-air register or near a radiator they dry as quickly as in a regular drier.

If you lack these sources of hot air, have a tapered, galvanised-iron cylinder made, with one end large enough to receive the end of the blotting-paper roll, the other end small enough to just take a 6-in. fan blade. Fasten the galvanised-iron cylinder in an upright position with a cheap electric fan at the small or lower end, with a gas-burner or small oil-stove near and slightly below. Roll up the prints in the roll, stuff the inside of the roll with an old piece of cloth, and drop in the funnel. With such a drier, about fifteen or twenty minutes will dry your prints; and no matter whether heat is used or not, they will come out flat and with a slight backward curl.

The sorting of the prints is done by first laying out the films on top of their respective envelopes, the original glass-pencil number on each film corresponding with its envelope number. The number stamped on the end of the film, in the printing room, corresponds with the number on the prints. If sorted first and trimmed later, the order can be checked and inspected for imperfect prints at the same time that it is trimmed.

A 10-in. trimming board, with a slot in the bench just beneath the edge for carrying off the paper trimmings, is used. If the trimmer is set on a special built-up table and a small 15-watt lamp arranged under the cutting edge in such a way that the light shines past the edge and through the print, it will be found that the correct margin can be judged more quickly

and the prints trimmed faster. The light, however, must not shine into one's eyes.

As the envelopes are checked, and the amounts due marked on them, the order book is again brought into play, and each order checked against it once more. A large check-mark is made through the order, and the amount due is marked at one side.

A few miscellaneous suggestions and I will close. For general lighting of the printing room, use either an Ingento indirect lighting fixture or else make one like it by taking a tin wash-basin, wire an orange bulb into it, hang it a few inches from the ceiling, and paint a white enamelled circle right above. You will be pleased with the result. In fitting up a printing room or a tank room, do not paint it black unless you want to see how much dirt you can collect in it. Paint the walls white or some very light colour. Be sure that the room is light-tight and that your ruby and orange lights are safe. The light-coloured walls will reflect much of the light, and the corners and floor will be well enough lighted to enable you to see things that you may drop; in addition to being safe from fog the light-coloured paint will practically force you to keep the place clean. A clean work-room, seen by a customer, at once stamps you as an unusual finisher.

Build your developing tanks large enough. If you choose your developer with a view to its keeping qualities you will be able to use it until exhausted; and, when you do this, there is nothing to be gained by having a smaller tank. In addition, the larger tanks will enable you to get your films developed, during a rush season, without working all night.

Have at least one more printing machine than you think you need. A finishing business can increase suddenly at times, and the printing room is generally the weakest link in such a shop.

Keep the work moving through at all times. Too much book-keeping can do more harm than good. If you have all the films that came in the morning or the night before developed, printed, and in the envelopes by five o'clock, there is no danger of getting them mixed up with the next day's work.

A small finishing business, built upon a foundation of good quality, prompt service, and reasonable price, has nothing to fear from the mail-order finisher or the larger finishing plants. A good black tone—one that is not muddy, olive, or blue—accurate white margins, twenty-four hour service (or less), and satisfaction to your customers—those are all that any finishing shop needs for success.

G. W. GREENE.

Assistants' Notes.

Notes by assistants suitable for this column will be considered and paid for on the first of the month following publication.

Bromide Toning Processes.

Most photographers use bromide paper these days, and quite a large proportion of the prints made on this material are toned by one process or another. Now sometimes the toning process used is absolutely the best possible for the conditions under which it is to be used and the results desired, but quite often this is not so. Professionals are very apt to get into a grave and stick there, and whatever toning process was used first is usually carried on with, without much consideration as to whether it is the best for the purpose or not. It is the purport of this article to give brief notes on the principal processes, and indicate for what class of work each is best suited.

We will first take toning processes for the production of sepia tones. There are three main classes: (A) Hypo-alum, (B) bleach-and-sulphide toners in several forms, and (C) liver of sulphur, a little-known, but most efficient, toner.

Hypo-alum is the best toner of all for quantity production. It is, on the whole, better suited for large batches of cheap or medium class work than for really high-class prints, although with due care beautiful tones may be obtained. Taking it on the whole the tones given by this method are rather inclined to purple. It is almost always necessary to use a hardening bath for the prints to be treated. The toner must be used hot if it is to work in a reasonable time. It appears to reduce prints slightly, especially when newly mixed. It is apt to deposit a scum on the prints, which should be swabbed with cotton-wool, and any fault in the paper base is likely to cause blisters on the prints. These are all its faults, and many of these will not be found of any great disadvantage in practical work. The virtues of hypo-alum are many and great, chief among them being regularity of tone, ease and speed with which large batches may be handled, and economy of cost. It is the cheapest of the sepia toners, and is the one most frequently used by trade printing houses. It should be mentioned that this is the one photographic solution which improves with use.

Our next group—bleach-and-sulphide—is rather complicated by the fact that many different formulæ have been published for obtaining the same result There is not a lot to choose between them as a rule. They fall under two main heads, bleach of potass ferricyanide and potass bromide, and bleach of permanganate, as brought forward by Mr. Greenall. I think the former is the better for general use, as it is more simple to use, but I believe that Mr. Greenall's method scores on the ground of cheapness. The usual formula gives potassium bromide in the bleacher, but it is an advantage both in cost and in the colour of the resultant prints to use ammonium bromide in its place. Taking bleach-and-sulphide methods on the whole, the advantages are: Very fine tones, ease in working small or medium size batches, cleanness of results, and the surety that the chemical action is complete, of which latter more later. The disadvantages are the liability of any impurity in the water to cause spots and markings, and the fact that small differences in the time of development of the prints make a big difference to the resultant colour.

These are, to my mind, the best processes to use when a fair number of first quality prints are wanted. It should be noted that when these processes are contemplated amidol is the ideal developer, not only for the fine colour it gives, but because it does not soften the emulsion of the prints as a developer containing an alkali must do, which is a great score in a process so liable to give blisters as sulphide toning.

There are many variations of these methods. One of the best is to place the print in the sulphide for a few moments before bleaching. They must be washed thoroughly before being proceeded with in the usual way; this gives very rich tones, but it is not easy to get big batches all the same colour by this method. Or another useful dodge is to bleach in the usual way, and then darken in pyro developer. The colour so obtained is rather a pleasing olive black. The bleached print may be partially darkened in any non-staining developer, and finished with sulphide. Quite a good range of warm blacks may be got in this way, but it is difficult to repeat them. Schlippe's salts may be used in place of sulphide for darkening, but it requires a really first-class original print. Then the tones are good and varied, but unfortunately variable.

The method suggested by Mr. H. W. Bennett, in which bichloride of mercury is used as the bleach, the darkening being done in sulphide, is a most interesting and useful one, but it can hardly be recommended as a commercial process because of the very deadly nature of the bichloride. It is a pity, because for warm blacks and deep browns the method is unbeatable.

Any sulphide-toned print may be further toned with gold—the usual P.O.P. formula; the results range from warm brown to red chalk. They are most effective, and may be considered permanent.

Our last sepia process is, to my mind, the most beautiful of all, and it is certainly the least known. It is the liver-of-sulphur method. Its advantages are in the beautiful tones it gives, in the fact that it is a one-solution process, so that the change of colour may be watched and stopped at the right time. It gives very fine tones on gaslight papers, which with ordinary methods tend to give yellow results. The disadvantage of liver of sulphur is the fact that it is not suited for large quantities. But I think it the ideal process for just a small number of really first-class results.

Now a word as to a most important matter—permanence. Leaving out of consideration the decomposition of the gelatine in which the image is formed, the only change likely to take place in the untoned print, providing it was well fixed and thoroughly washed,

is the conversion of the silver image into one of silver sulphide, by exposure to an impure atmosphere. Now this is absolutely the same thing as sulphide toning, only the process may take years to show and never be completed. It is, therefore, obvious that a sulphide-toned print stands a better chance of remaining unchanged than an untoned one, and, further, that the more complete the change the better the chance of absolute permanence. It is here that the bleach processes score, because it is essential that both the bleaching and the darkening shall be thorough if a passable result is to be obtained. In the case of a single solution toner the action may be incomplete, and it may, therefore, continue under bad conditions. It will not cause fading, or even any very marked change in colour, but it may be quite enough to make well matched spotting show up very badly.

On the whole, however, one may say that, so far as the image itself is concerned, a sulphide-toned print is unbeatable for permanence among silver images.

These are the processes most likely to find favour, but there are several other methods of toning which may be useful. Foremost among these is copper toning. This is a cheap and convenient toner for colours, from warm black to red chalk. It is used in one solution, so that the extent of toning may be observed and stopped at the right moment. The results of copper toning were at one time thought to be impermanent, but this must have been to a large extent due to careless methods of work. The prints should be at least as permanent as untoned prints.

The ordinary gold-toning bath, as used for P.O.P., may be used on untoned bromide prints, and will give a striking and not unpleasant blue-black effect, which may be found useful for special effects, especially strong lightings. The results are considered fairly permanent.

Uranium toning was at one time a very popular process, and it is still largely used in cheap studios for red chalk tones. It is, unfortunately, a most impermanent method, and its use is not to be recommended except for the cheapest work.

Green tones are best obtained by the use of Mr. H. E. Smith's formulæ, as given in the "B.J. Almanac." This is not quite so simple to make up or to use as some formulæ, but the results are fairly permanent, which is more than can be claimed for most green tones. In addition to this, the colours are quite pleasing.

The blue-toner given in the "Almanac" is also about the best for general use, the colours being really good. But, to my mind, when only an occasional print is to be treated, it is far better to buy the blue and green toners in tablet form. In this way the purchase of a number of uncommon and, for other purposes, useless chemicals is avoided, and the solutions may be prepared fresh with the least possible trouble. Of course, if a regular line is to be made of it, it is cheaper to mix your own.

In conclusion, may I suggest that to any photographer of an experimental turn of mind toners offer a wide and interesting field? They may be very profitable, too, for a unique tone is a wonderful "draw" for a studio. Experiments might be made not only in the way of combining known toners, but in the use of new reagents.—ARTHUR G. WILLIS.

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Applications, December 1 to 6.

FILMS.—No. 29,861. Photographic films. W. H. Edridge.

FILM CAMERA AND SPOOL.—No. 30,454. Focussing film camera and spool of film. F. G. Cook.

PRINTING MACHINES.—No. 30,331. Photographic printing machines. B. J. Hall.

FILM WASHING AND DRYING.—No. 30,353. Washing and drying photographic films, etc. S. R. Pearse.

CINEMATOGRAPHY.—No. 30,470. Cinematograph projectors. Sir O. Stoll.

CINEMATOGRAPHY.—No. 30,471. Cinematograph cameras. Sir O. Stoll.

COMPLETE SPECIFICATIONS ACCEPTED.

These specifications are obtainable, price 6d. each, post free, from the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.

The date in brackets is that of application in this country; or abroad, in the case of patents granted under the International Convention.

PRINT-DRYING MACHINES.—No. 134,771 (May 9, 1919). The invention relates to means for drying photographic prints and to that class of machine, for example, described in Patent No. 121,936. In this class of machine a drying drum is heated by means of hot gases, and is rotated by means of a worm wheel actuated by a

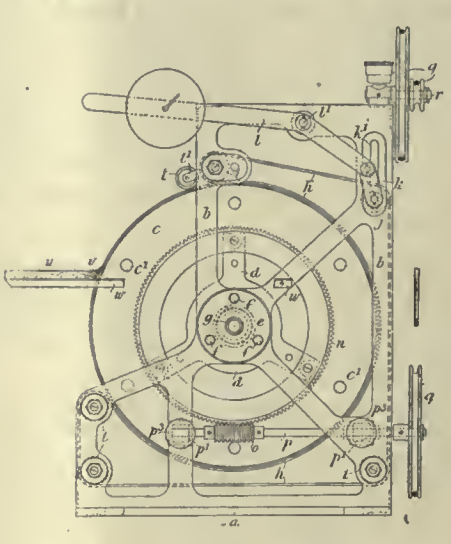


Fig. 1.

worm which is driven by a suitable motor, an endless band or apron being provided in conjunction with the drum or cylinder and mounted on rollers, the tensioning roller being adjustable so that the tension of the apron can be regulated and a squeegee

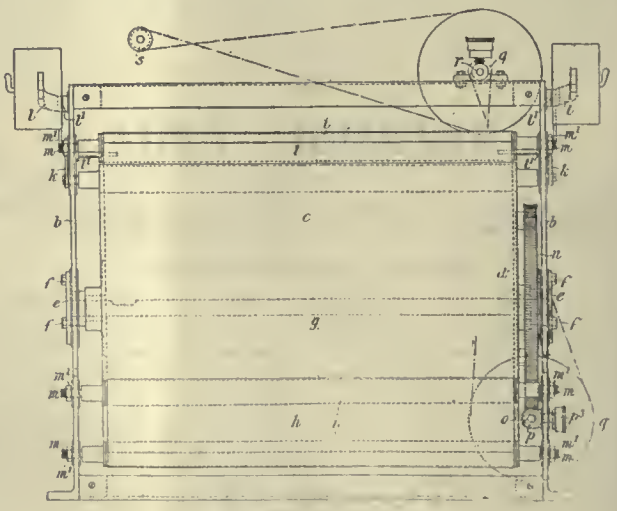


Fig. 2.

being provided to remove the surplus water from the drum or cylinder.

The object of the present invention is to provide a compact machine of that class which can be easily assembled and dismounted.

The drying drum is carried at each end by means of a spider frame placed within the supporting frame and bolted to the end face of the drum and rotatably mounted upon a sleeve secured to a vertical upright forming a portion of the supporting frame.

The worm wheel is secured to the spider at one end of the drum by means of bolts near the teeth of the worm wheel, and the worm gearing is carried by a spindle mounted in bearings within the frame.

In conjunction with the drum or cylinder there is provided the usual endless band or apron mounted upon rollers arranged in the usual way so that the points are passed around the drum between its surface and that of the band, the band being brought to the requisite tension by means of counter-weighted levers, which carry by means of links the tensioning roller which moves in slides or guides in the machine frame. At its upper part the drum is furnished with a squeegee roller, the function of which is to remove from the prints to be dried the surplus water, which flows over the surface of the drum on to a shelf supported in the frame and furnished with a groove for the escape of the water.

The guide-rollers for the endless band or apron are supported in bearings or upon pivot pins in the sides of the machine frame, these pivot pins extending into axial holes in the ends of the rollers and being screw-threaded so as to engage screw-threaded holes in the frame in which they are secured or locked in position by means of nuts. The worm shaft is carried in a pair of bearings which are easily detachable from the frame, each being advantageously secured to the frame by means of a lubricating cup which is furnished with a screw-threaded socket engaging a screw-threaded stem or shank on the bearing, which stem extends through a hole in the machine frame, and a lubricating passage extending through the bearing stem and connecting the bearing with the lubricating cup.

The drum and band or apron are preferably driven from an electric motor which is conveniently fitted upon the top of the

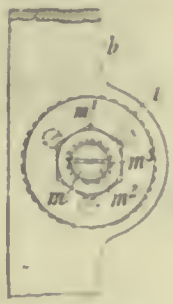


Fig. 3.

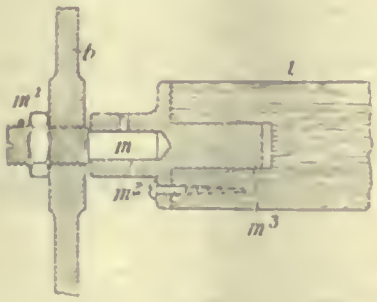


Fig. 4.

machine frame and drives the worm shaft through the medium of any suitable speed-reducing gear.

In the drawings *a* indicates the base of the supporting frame of the machine and *b* the two upright sides. *c* indicates the drum which is heated, and is carried by the end spiders *d*, each of which is rotatably mounted upon a flanged bearing sleeve *e* secured to the sides *b* of the frame by means of the bolts *f*.

*c*¹ are ventilating holes provided in the ends of the drum, and *g* is a pipe which serves for the introduction of gas or electric current into the interior of the drum. In the interior of the cylinder *c* the tube *g* is furnished with a support carrying at its upper end a gas burner or electric heating element.

h indicates the endless apron or band which is passed around the guide rollers *i* rotatably mounted in bearings carried by the sides *b* of the frame, and in such a manner that the apron envelopes the outer periphery of the drum *c* for the greater part of its extent in the usual manner, as shown in fig. 1. The roller *j*, which also serves as one of the guide-rollers, is used for the purpose of imparting the requisite tension to the apron, the roller, for this purpose, being carried by links *k* so that it can move in lateral slots *k*¹ in the sides *b* of the frame, the links themselves being pivoted to the short arm of counter-weighted levers *l*, which are pivoted at *l*¹ to the machine frame *b*.

A suitable form of bearing for the guide and tension rollers is shown in detail in figs. 3 and 4, and comprises the screw-threaded pivot pin *m*, which is screwed into the machine frame *b* and secured or locked by means of the nut *m*¹ and enters an axial hole *m*² in a metal end piece *m*³ provided upon the roller. This method of mounting is not only simple in construction, but also permits of the rollers being assembled and dismounted quickly and with facility. The drum *c* is driven by the following mechanism, that is to say, the worm wheel *n*, which is secured to the spider *d* at one end of the cylinder by means of bolts near the teeth of the worm wheel, and is in mesh with the worm *o* keyed upon the spindle *p*, which is mounted in bearings *o*¹ secured to the machine sides *b*, and is driven by means of the belt and pulley gear *q*, *q* from the counter-shaft *r* itself driven from an electro-motor indicated diagrammatically at *s* in fig. 2, and mounted upon the upper part of the machine frame.—Sydney Harold Morse, Finsbury Pavement House, London, E.C.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

SATURDAY, DECEMBER 20.

Dennistoun Amateur Photographic Association. 12th Scottish National Salon, People's Palace.
Partick Camera Club. 12th Scottish National Salon opens in People's Palace.

MONDAY, DECEMBER 22.

Bradford Photographic Society. "Tips and Dodges." B. Riley. "Copying." W. H. Hammond.
City of London and Cripplegate Photographic Society. Members' Print Competition.

TUESDAY, DECEMBER 23.

Hackney Photographic Society. Chat Round the Fire.
Bournemouth Camera Club. "One Man Show." F. J. Mortimer's Prints.

WEDNESDAY, DECEMBER 24.

Croydon Camera Club. Conversational Meeting.
Dennistoun Amateur Photographic Association. "Portraiture Before the Days of the Camera." J. Hack.

PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

A SPECIAL general meeting of the Professional Photographers' Association was held at 35, Russell Square, London (the house of the Royal Photographic Society), on Friday, December 12, 1919, for the purpose of altering the rules.

In the unavoidable absence of the President of the Association, Mr. R. N. Speaight took the chair. The Honorary Secretary having read the notice convening the meeting, the Chairman explained that the object of the proposed alteration of the rule was to give the Council power to employ either a paid or an honorary secretary or both, as they may think fit. According to the existing rules they were bound to appoint an honorary secretary. The Council required greater freedom of action in view of the increasing membership, activity, and importance of the Association. He therefore moved, on behalf of the Council, that Rule 10 should be amended and should read as follows:—

"10. Officers.—The honorary officers of the Association, constituting the Council, shall be a president, the past-president, a treasurer, and twenty-four ordinary members of Council, of whom twelve shall be London and twelve country members. They shall have power to appoint a secretary and/or an assistant secretary, who may be paid. At meetings of the Council five shall form a quorum."

A brief discussion followed, and subsequently the resolution was carried unanimously.

A vote of thanks to the chairman closed the proceedings.

ROYAL PHOTOGRAPHIC SOCIETY.

MEETING held Tuesday, December 16, Dr. G. H. Rodman in the chair.

Mr. N. E. Luboshez was to have given a demonstration of fancy lighting in portraiture, and had temporarily installed a number of electric lamps for the purpose. Owing, it must be supposed, to some overloading of the electric system, some fuses gave out, and it was unfortunately not possible to replace them in time for the demonstration to be given. Yet those who know Mr. Luboshez will not doubt that under this disability he was nevertheless able to deliver a fluent and interesting discourse on the subject which it had been his

intention to demonstrate. The demonstration itself will be given at one of the meetings in February next.

On the proposition of the chairman, the thanks of the audience were cordially expressed to Mr. Luboshez.

Commercial & Legal Intelligence.

NEW COMPANIES.

SOUTHGATE BROS., LTD.—This private company was registered on December 4 with a capital of £5,000 in £1 shares. Objects: To carry on the business of photographers, etc. Agreement with W. E. and L. Southgate. First directors are W. E. Southgate, 33, Queen Street, Maidenhead, and L. Southgate, 33, Queen Street, Maidenhead, both photographers. Registered office: 33, Queen Street, Maidenhead.

GARNETT PICKLES PREPARATIONS CO., LTD.—This private company was registered on December 9, with a capital of £3,000 in £1 shares (1,500 8 per cent. cumulative preference). Objects: Manufacturers of and dealers in photographic apparatus and materials, etc. The subscribers (each with one share) are:—T. H. Bailey, 25, Windermere Avenue, N.3, chemist, and R. Garnett Pickles, 7, King's Parade, N.3, chemist. The first directors are R. Garnett Pickles (managing director), T. H. Bailey (chairman), H. A. F. King, and L. A. Moores. Registered office: Cromwell House, High Holborn, W.C.1.

WALTON ADAMS AND SON, LTD.—This private company was registered on December 6 with a capital of £3,000 in £1 shares (1,000 6½ per cent. preference). Objects: To take over the business carried on at 29, Blagrave Street, Reading, by A. W. Adams as "Walton Adams and Son," and to carry on the business of photographers, photographic artists, picture dealers, etc. The subscribers (each with one share) are P. P. Crowe, 149, Ongar Road, Brentwood, photographer, and T. W. Alderman, 19, Warwick Road, Upper Clapton, E.5. The first directors are P. P. Crowe and T. W. Alderman (both permanent). Secretary, Winifred Crowe. Registered office, 29, Blagrave Street, Reading.

News and Notes.

M. MISONNE'S PHOTOGRAPHS.—An exhibition of the charming landscape work of M. Misonne, who may appropriately be called the Corot of photography, will open at the Hampshire House Photographic Society, Hog Lane, Hammersmith, on January 1 next.

LECTURES ON APPLIED OPTICS.—Among the lectures to be delivered at the Royal Institution, Albemarle Street, London, W., after Christmas are two on "Recent Progress in Applied Optics," by Dr. A. E. Conrady, Professor of Optical Design, Imperial College of Science, London. The lectures will be delivered on February 5 and 12 at three o'clock

KEROTYPE MATERIALS.—In our brief notice last week of the series of demonstrations of the Kerotype process at Messrs. Marion's, it should have been stated that Messrs. Marions are sole wholesale distributors of the Kerotype papers, and that all communications relating to the buying and use of the papers should be addressed to them at 3, Soho Square, London, W.1.

Two "B.J." SPECIALS.—Two of the little handbooks issued from the "B.J." office have just been published, each in a fourth edition. These are the "Portrait Studio," by "Practicus," price 1s. net (postage 2d.) and "Sketch Portraiture," by J. Spencer Adamson, price 9d. net (postage 1d.). Both these little manuals treat of their subject in an eminently practical way, and the continuous demand for them is no doubt the best tribute to their usefulness to the photographer which could be made.

J. F. SHEW AND CO.—In reference to our note of last week, Mr. W. J. Ramsey writes to us from 62, Wellesley Road, Harrow, asking us to point out that Mr. Garrad was never manager of Messrs. Shew's business, of which Mr. Ramsey was sole proprietor, nor had he any connection with the business whilst under the title of J. F. Shew and Co. Mr. Ramsey eventually sold the business to Messrs. Garrad and Dale, who were carrying on the business of Staley and Co., and it was on the completion of the sale that the businesses were combined under the title of Staley, Shew and Co.

LECTURING WITH THE LANTERN.—A somewhat revised text of an address on lantern lecturing delivered by Mr. Grenville A. J. Cole, F.R.S., to teachers and lecturers at the Royal College of Science for Ireland has been issued in pamphlet form by Mr. T. H. Mason, optician and lantern-slide maker, 5 and 6, Dame Street, Dublin. Mr. Cole deals with a subject of great interest to photographers and to photographic societies in so human and humorous a way that with his permission we hope to print his paper in a forthcoming issue of the "B.J." In the meantime there must be many who would like to possess the pamphlet in separate form, as they may do by application to Mr. Mason.

A NEW SANDS-HUNTER LIST.—A supplementary list of second-hand apparatus has just been issued by Messrs. Sands, Hunter and Co., Ltd., 37, Bedford Street, Strand, London, W.C.2. It is a well-printed catalogue of eighty pages, every item of apparatus in which is identified by the firm's series number, so that the intending purchaser is able to indicate the goods which he wants with the least possible outlay of trouble. Moreover, the clear classification of the goods, both cameras and lenses, under their various headings, makes it the easiest matter for the intending buyer to satisfy himself as to whether he can get what he is seeking. In the case of lenses a particularly clear tabular arrangement has been newly adopted, the type-setting of which affords a rapid glance over the particulars of each lens offered—viz., focal length, aperture, plate covered, and price. Inasmuch as the trade in photographic apparatus has of late gravitated largely towards the supply of second-hand goods, Messrs. Sands, Hunter's catalogue is a piece of trade literature of special importance, in fact one which no photographer, professional or amateur, can afford to overlook whenever he has a purchase to make.

Correspondence.

**** Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

**** We do not undertake responsibility for the opinions expressed by our correspondents.*

LENS-SEPARATION IN STEREOSCOPIC PHOTOGRAPHY OF SMALL OBJECTS ON THE SAME OR AN ENLARGED SCALE.

To the Editors.

Gentlemen,—Mr. Chas. E. Benham's formula for finding the separation of the lenses seem extremely good, but appears to call for a few comments.

If the requirement is to render the object as it appears to the naked eyes at their near point (12 ins.), then it will not do to take the lenses closer than 12 ins. to the object, because impossible visual perspective will be introduced.

If natural perspective is required then I would suggest that 6-in. lenses be used at 12 ins. distance, thus getting natural size. Then if that be not large enough when viewed in a magnifying stereoscope, enlargements from the negatives should be made and mounted up as stereographs.

I am glad to see Mr. Benham gives the optical axes converging, because most writers—and camera makers too—seem to presume that they must always be parallel.

And this is why the formula "leads us astray" at greater distances, because as the object recedes so the convergence of the optical axes should decrease until at a few yards they become practically parallel.

To make the formula a little more exact I would suggest that the

2¾ ins. be reduced to 2¼ ins. I have measured the interpupillary distances of hundreds of patients, and I find that the average when the eyes are fixing infinity is 2¾ ins., and while fixing a point at 13 ins. the average comes out at 2¼ ins. This seems to show that most stereoscopic photographs are taken with the lenses set a little bit further apart than the average human eyes. The difference though, of course, is trifling.—Yours faithfully,

ARTHUR G. WILLIAMSON.

A WARNING AS TO THE USE OF FORMALINE IN TROPICAL DEVELOPMENT.

To the Editors.

Gentlemen,—I have noticed during the past year or two a tendency to advise the use of formaline in fixing baths for use in the tropics.

My experience in tropical photography covers over thirty-five years, and during the major portion of that time I had been travelling in the bush towns, where there is no ice available, and where the only means of obtaining cool water is by means of the well-known canvas "water-bag."

About twenty years ago formaline was being listed as a regular thing in our photo-chemical lists, and I tried it for the purpose of hardening the film so that I could develop without so many of the usual cooling precautions. It acted all right both as a preliminary bath and as an admixture in the fixing bath, but I gave up the use very soon on account of the injury to my eyes.

I think, so far, my experience was about the same as that of the present-day experimenters in the use of formaline, but note the sequel. Four or five years later, when looking up old negatives for re-orders, I noticed occasional ones which were cracked all over like a fine mosaic, and on rubbing them with the finger the cracked film could be reduced to a dry powder. I eventually found that these were the formaline-treated negatives; the tough, leathery nature of the gelatine had been destroyed by the strong tanning effect of the formaline.

I would be pleased if you would sound this note of warning in the "Journal," and ask for further experiments as to the after-effects of such strong tanning agents before passing on these formulæ to the public.

I may here mention that the effect of strong alum baths or hardening fixing baths containing alum and acid has never been like that of formaline.

Should it interest any of your readers, I would be pleased to give them my method of developing plates in the tropics when ice is not available.—Yours faithfully,

Cairns, N. Queensland. A. CHARGOIS.

[We shall be glad if Mr. Chargois will carry out the offer which he kindly makes in his last paragraph. As regards alum, we do occasionally come across cases of bad film disintegration, due to its use, but they are generally of negatives which have been kept for twenty years or more.—EDS. "B.J."]

FORTHCOMING EXHIBITIONS.

December 20, 1919, to January 24, 1920.—Scottish Photographic Federation. Sec.: John Macdonald, 27, Aberfeldy Street, Dennistoun, Glasgow.

AERIAL PHOTOGRAPHY.—The most prominent announcement of the commercial use of aerial photography is a whole-page advertisement which appears in the "Imperial and Foreign Trade Supplement" of Saturday, December 13, issued from the "Times" office. The advertisement announces the facilities for photographic work from the air of the Aircraft Manufacturing Co., Ltd., Hendon, N.W.9. It is stated that although the aerial photographic department of the firm has been in existence for only a few months, over a quarter of a million pictures have already been sold. The firm is equipped for the photography of factories, estates, towns, etc., from the air, and is issuing a series of view postcards of all the beauty spots in England as seen from an Airco machine.

Answers to Correspondents.

SPECIAL NOTICE.

In accordance with our present practice a smaller space will be allotted to replies to correspondents.

We will answer by post if stamped and addressed envelope is enclosed for reply: 5-cent International Coupon, from readers abroad.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

F. V.—As you do not mention the candle power of your lamps it is impossible to say what exposures will be necessary. With about 4,000 c.p. you could do what you require providing that your lamps are not more than, say, 6 ft. from the sitter.

A. C.—The regulation requiring licences for new businesses is to be discontinued at the end of the present month, so there will be no occasion for you to trouble about it. Yes, if the business is not carried on in the correct names of the partners it will be necessary to register. The fee is 5s.

G. B. K.—The result is not bad, but you ought to be able to get rid of the band of reflection running down the middle of the jug. We should guess that this is due to reflection of some part of the camera in the metal surface. And if this is so, covering of the whole camera, barring the lens, is indicated as the means to avoid the defect again.

S. J.—The usual method is to hot roll the prints, after dipping in methylated spirit, in contact with thin celluloid. A suitable roller is, or was, supplied by Messrs. Fallowfield, 146, Charing Cross Road, London, W.C.2. You can get suitable celluloid, also a cement which can be used instead of hot rolling from Messrs. Rheinlander and Son, New Malden, Surrey

A. D.—It is necessary to vignette negatives usually by means of a serrated card held in front of the lens at a few inches distance from it. Most of the supply houses, such as Griffin's, of Kemble Street, Kingsway, London, W.C.2, or Marion's, 3, Soho Square, London, W.1, supply fittings for holding the card in position and moving it about as required for the effect and by the subject.

J. H. (Omaha, Nebraska).—There is no satisfactory means of taking out developer stain from clothing. If the fabric is light in colour you can try the effect of mixing a little bleaching powder (chloride of lime) with water to make a stiff paste and add a little hydrochloric acid—just enough to give it a chlorous smell. But this will usually also take out the colour of the fabric, so that the best thing is to try to match up the stain with ink.

J. H. N.—You first require to be a member of the Royal Photographic Society, which is a formal matter. You should write to the Secretary, 35, Russell Square, London, W.C.1, for a form of application. Admission fee is £1 and the annual subscription at present one guinea, although it is proposed to increase it to two guineas after the end of the present year. As regards the Fellowship, conditions are published by the society.

P. R.—We suppose your lens is the 12-in. No. 6 Celor, listed to cover a 9 x 7 plate at full aperture, but this aperture was $f/5.5$, not $f/4.8$. The pre-war list price was £17 10s. If the lens were in perfect condition it ought to fetch pretty nearly its pre-war list price, but a conspicuous scratch, even if the performance of the lens is all right, can easily reduce its value to a direct purchaser to something like £10.

C. A. G.—We are sorry we cannot turn up any instructions for the use of the "Palmos" camera, and if we could they would probably not be reliable for your purpose, since the table of speeds, according to slit-width and spring tension, probably varies considerably with each size of camera. We suggest that you either write to Messrs. Ross, Ltd., 89, Great Castle Street, London, W.1, who have taken over Messrs. Zeiss's stock, or else send the shutter for the speeds to be tested to the National Physical Laboratory, Teddington, Surrey.

G. M.—We remember the Heyde actinometer which was on the market a year or two before the war. It never had much sale, and now we are unable to turn up the precise method of using it. The general principle is to look at the deepest shadows of the subject through the hole in the instrument and to move a wedge-shaped screen until you can just not see the shadow detail. This position of the scale is supposed to tell you what exposure to give with a given stop and speed of plate. We do not think that this system is anything like as reliable as an ordinary exposure meter.

A. C.—You can certainly manage with the premises you sketch, but we do not think you have planned out the space to the best advantage. We should suggest making quite a small dressing-room and using the rest of the space next the passage as a dark-room. Then you could put your background close to the window enclosure, and get the full 24 ft. for the studio. We do not like the idea of folding doors. At night or in bad weather it will be unpleasant for the operator as well as for the sitter, and in day-time they will admit too much light and interfere with your artificial light.

L. R.—The double exposure has nothing to do with the covering of the lens, but arises simply from the fact that in posing the sitter twice one image has encroached on the other. You should draw a fine pencil line straight down the ground-glass screen, and then take care that each pose comes just sufficiently to right and left of it. If you use a very dark background you don't need to use a shielding shutter on the lens at all, but if the background has any pattern you, of course, need to do so. If you fix the shutter about 1 in. or 2 ins. from the lens you will have no difficulty in vignetting one exposure nicely into the other.

O. O.—There is always a lot of difficulty in getting rid of pattern when using these filament lamps, especially with large condensers. The only suggestion we can make to improve the conditions which you describe is to use an objective of longer focus, though still, if you can, of large aperture. A longer focus lens in conjunction with a ground-glass screen as close against the lamp as you can put it may get rid of the trouble, although it is doubtful if it will. The fact is you are trying to work a very difficult system, and would do much better with a small arc lamp such as one of those of the Westminster Engineering Co., Victoria Road, Willesden Junction, London, N.W.

A. J.—A supplementary lens increases the relative focal aperture by decreasing the focal length and therefore upsets the focussing scale. In the case of such a very short focus as 3 ins., made still shorter by the use of the supplementary lens, no doubt this would not matter very much for subjects for which the camera is used at the infinity extension, but the scale markings for the nearer distances would be useless. From a practical point of view we think a much better plan, if it is a vest-pocket Kodak, would be to have an adapter for it to take plates. This, if you use the ultra rapid plate, would reduce exposures two or three times. The plate adapter is a little accessory supplied by the Paris firm of Tiranty, and recently noticed in the "B.J."

E. B.—We think that you will find a total of 2,500 c.p. hardly sufficient for rapid exposures. We should recommend four 1,000 c.p. lamps. It would be better, we think, to rely upon reflectors for lighting the shadow side, starting with the first lamp opposite the centre of the background and the others in a curve, the last one being nearly opposite the edge of the background. You will find some useful information in the article published in the "B.J." of February 7 last. The subject has not been dealt with in any recent "Almanac," and there is no book specially devoted to the subject. If you can manage it, arrange for the lamps to be raised and lowered, as you will find that for sitting figures and children you will shorten exposures by bringing the light nearer the sitter.

F. S.—We are very sorry we cannot throw any light on the spots in the blotting boards, for this is the first instance that we have had, and we are at a loss to account for the spots. We do not think it conceivable that properly made sulphide-toned prints could be spotted through being laid on blotter which is defective in the way yours appears to be, and vice versa it is most unlikely that the blotter would become spotted by the action of the wet prints only. We think that the most likely explanation is that the blotter has got certain defects in it in the shape of spots, and that these are made visible by the continued presence of moisture, but we do not think there is any real connection between the spots on the blotter and those on the print. We think your best course would be to return the blotters to the makers, preferably after making a further test in the shape of simply letting the blotter (without prints) remain slightly wet for a few days and seeing if any spots develop.

F. L. S.—1. The "Bram" of Wahltuch Smith and Co. 2. Nothing better than the use of a serrated vignetting mask held between the lens and the paper. 3. Certainly best in front of the lens, where it can be readily adjusted as regards distance from the lens, etc. 4. Very little to choose between the various leading makes on the market. 5. Distance of the bolting silk from the paper makes a great difference to the results. If you put it quite close you simply impress the pattern of the silk on the enlargement; it requires to be an inch or two from the paper by having it mounted upon an open frame of suitable depth. 6. A matter of expediency or economy. Both methods are very commonly used. The cheaper class of studios regularly go in for enlarging. 7. Probably you have not followed the directions exactly in making the mixture of sulphite and metabisulphite. For the best results this solution should be boiled before dissolving the pyro. 8. On the whole there is no better developer for portrait negatives than pyro-soda. If used weaker (more water) it will give any degree of softness, and vice versa of vigour if used stronger.

R. T.—(1) A long-focus lens—that is, a lens of long focal length—is one which requires a relatively great distance between the lens and the plate when photographing in the ordinary way. For example, 16 in. focus for a half-plate camera would be reckoned a long focus. A short-focus lens is one requiring a relatively short distance—for example, 5 or 6 in. in the case of a half plate. The effect of long focus is to give a large size reproduction of whatever you are photographing and at the same time to include relatively less of the subject; with a short-focus lens you include a very great deal more on the plate, but it is all on the smaller scale. (2) A lens is either fast or slow, according as the largest stop is large or small compared with the focal length. That is, if the diameter of the stop is as much as one-quarter of the focal length, it is a very rapid lens, and is called $f/4$, whereas if the diameter of the stop is as little as $\frac{1}{8}$th of 1-16th the focal length, that is a relatively slow lens of $f/8$ or $f/16$. (3) Unfortunately, all the elementary text-books on lenses are now out of print, but you could get second-hand from a firm like Messrs. Foyle, 121, Charing Cross Road, London, W.C.2, either "The Lens," by Brown and Bolas, or "Photographic Lenses," by Beck and Andrews, the price (pre-war) being 2s. 6d. and 1s. respectively.

The British Journal of Photography.

The Oldest Photographic Journal in the World.

PUBLISHED EVERY FRIDAY. ESTABLISHED 1854. **PRICE TWOPENCE**

TERMS OF SUBSCRIPTION, POST FREE.

UNITED KINGDOM.—One Year, 10s. 10d.; Six Months, 5s. 5d. Three Months, 2s. 9d.

CANADA ... ... AUSTRALIA ... ... NEW ZEALAND ... ... SOUTH AFRICA ... ... UNITED STATES OF AMERICA SOUTH AMERICA ... ... INDIA AND FAR EAST ... ... CONTINENT OF EUROPE ...	*One Year.* Thirteen shillings (13s.), or 3 dollars 17 cents, or 22 francs, or 9 rupees 12 annas, or 6 yens 30 sens.
FEDERATED MALAY STATES, BORNEO AND SARAWAK	5 dollars 57 cents.

HENRY GREENWOOD & CO., LTD., Proprietors and Publishers, 24, Wellington Street, London, W.C.2.

IMPORTANT NOTICE TO READERS.—Until further notice agents will supply the "B. J." to order only, as the high price prevailing for everything in connection with newspaper production prohibit the distribution of surplus copies for chance sales. It is therefore necessary in order to ensure the regular delivery of the "B. J." each week to place an order definitely with a dealer, newsagent or bookstall clerk, or to send a subscription to the publishers.

The
British Journal of Photography

TELEGRAPHIC ADDRESS: PHOTOMETER, RAND, LONDON. | THE RECOGNISED ORGAN OF PROFESSIONAL AND AMATEUR PHOTOGRAPHERS. (ESTABLISHED 1854.) (PUBLISHED WEEKLY. | TELEPHONE No. 2722 GERRARD.

Vol. LXVI.—No. 3112] REGISTERED AT THE G.P.O. AS A NEWSPAPER. FRIDAY, DECEMBER 26, 1919. RIGHT OF TRANSLATION RESERVED. [PRICE ... 2d. STAMPED 2½d.

'XTREME PLATE 400 H.&D.

Wellington

BROMIDE & B.B. PAPERS

World-famous for supreme quality and uniformity.

SELTONA

Sole Manufacturers: THE LETO PHOTO MATERIALS CO., LTD., 1, CRUTCHED FRIARS, LONDON, E.C. 3.

THE FINEST PRINTING MEDIUM OF THE AGE

SEPIA TONES BY FIXING ONLY.

MADE IN FIVE GRADES ALSO "LINIQUE."

BARNET

THE NEW MEDIUM FOR PORTRAITURE. Particulars of ELLIOTT & SONS, Ltd., Barnet.

SUEDE CREAM BROMIDE

BROMIDE GASLIGHT

ILLINGWORTH'S PHOTO PAPERS

T. ILLINGWORTH & Co., Ltd. WILLESDEN JUNCTION, LONDON, N.W.

Griffin's KINGSWAY, LONDON.

Time and labour economy. Regular negatives. Better negatives. Griffin's **PREMIER DEVELOPING TANKS,** the dependable tanks. Two sizes ready, postcard and half-plate, for 24 plates each, 20/- and 21/. All teak wood. No corrosive metal parts. Superior Griffin manufacture.

AMIDOL-JOHNSONS USED & PROVED BY ALL

JOHNSON & SONS Manufacturing Chemists Ltd. FINSBURY, LONDON

The British Journal of Photography.

Net Prepaid Line Advertisements.
Charges for Insertion.

12 words or less 1/-
Extra words ... ... 1d. per word.

(No reduction for a series.)

Special Note. Advt's. under a Box Number.
"Box No." and office address .. .. charged as 6 words.
For forwarding replies add .. 6d. per insertion for each adv't.
If replies are called for this latter charge is not made.

Orders to repeat an advertisement must be accompanied by a cutting or copy of the announcement as previously printed.
Advertisements are not accepted over the telephone or by telegram.
The latest time for receiving small line advertisements is 12 o'clock (noon) on Wednesdays for the current week's issue, but the insertion of an advertisement in any definite issue is not guaranteed.

Since advertisements cannot be inserted until fully and correctly prepaid, senders of line announcements are asked to bear in mind the scale of charges. They will thus save themselves delay in publication of their announcements.

Cheques and Postal Orders should be crossed " & Co.," and made payable to HENRY GREENWOOD & CO., LTD.

DEPOSIT SYSTEM.—When selling goods to strangers, or purchasing, all risk is avoided by employing our deposit system. Cost is trifling. The purchase-money must be deposited with the publishers, HENRY GREENWOOD & CO., LTD., 24, Wellington Street, London, W.C., 2, and all Cheques, Money Orders, &c., made payable to them. Acknowledgment is sent to both parties, and deposit is held until receipt of advice that goods have been received and found satisfactory, in which case the amount deposited is forwarded to the seller, less a commission of 5½ per cent. (minimum, one shilling; maximum, two shillings and sixpence). If goods are not approved the publishers wait original owner's acknowledgment of their safe return before refunding the deposit. In this case the minimum commission only (one shilling) is deducted. All disputes or questions arising from such causes as damage of goods in transit, &c. must be settled between the contracting parties. The deposit is held by Messrs. Greenwood pending settlement. Messrs. Greenwood do not undertake to express any opinion on the condition or value of goods, nor must the goods be sent to them.

*** To prevent delay communications relating to Advertisements and general business affairs should be addressed to the publishers. All advertisements are received subject to their approval or revision, and the right is reserved to refuse any advertisement without giving a reason for so doing. The publishers are not responsible for clerical or printers' errors, but every care is taken to prevent mistakes.

HENRY GREENWOOD & CO., LTD., Publishers, 24, Wellington Street, LONDON, W.C., 2.

Situations Wanted.

A REALLY good Printer, age 32, desires berth with good firm, 17 years' experience; not afraid of work.—Box O. 8, 24, Wellington St., W.C.2.

COLOURIST and Finisher (lady), aerograph; 7 years' experience in first-class studio; able to operate; state salary; Manchester preferred.—Box O. 1, 24, Wellington St., W.C.2.

DEMOBBED soldier, unable to follow former employment, desires situation in good London studio; some experience in the trade; highest references.—" K.," The Priory, Hatfield.

GENTLEMAN, 25 years' good experience, desires berth as Operator-Manager.—23, Swallowfield Rd., Charlton, S.E.7.

OPERATOR (27), assist generally, retouch, enlarging, framing, sepia work.—" S.," 19, Cecil Rd., Ilford, London.

OPERATOR or Operator-Manager, good middle-class; take entire charge; many years own business; also outdoor work; start at once; any part of country; salary £3 10s.—Wilson, 58, Grosvenor Rd., Newcastle-on-Tyne.

OPERATOR-RETOUCHER, all-round experience, disengaged shortly; good refs.; London or near.—Box O. 7, 24, Wellington St., W.C.2.

RECEPTIONIST, educated woman, considerable experience photographic business, good correspondent, accountant, desires engagement as receptionist-secretary to lady photographer.—Box O 6, 24, Wellington St., W.C.2.

REPRESENTATIVE, professional photographer, covering Lancashire, Yorkshire, Potteries, and Lincolnshire, is open to accept agency on commission only for photographic apparatus, plates, paper, or chemicals.—Box M. 8, 24, Wellington St., W.C.2

Situations Vacant.

COMPETENT Lady Retoucher-Finisher required, skilful with aerograph, and with original ideas for sketch backgrounds; good colourist and capable of operating in principal's absence; only those requiring permanency please apply.—Allwork, Tonbridge.

LESSONS.—Negative Retouching, B. & W., Colours, Miniatures, Operating, Posing, Lighting; slow retouchers, artists quickened, improved; lessons, day, night post (all countries); B. & W. pupils taught " Aerograph," retouching pupils " Negafake " erasing (knife substitute). This paper's Editor stated re a pupil's work: " We congratulate both tutor and pupil."—T. S. Bruce (Rewriter Standard work, " Johnson's Retouching "), 4, Villas-on-heath, Vale, Hampstead, London, N.W. See pp. 27-30, " B.J. " Almanac, 1914.

OPERATOR wanted for branch studio; must have first-class experience.—Apply, with specimens, and state terms and experience, to Lafayette, 160, New Bond St., W.1.

RECEPTIONIST-FINISHER, for highest-class Surrey business; well experienced; preferably over thirty.—Box M. 15, 24, Wellington St., W.C.2.

REQUIRED for high-class photographic studio in the East, an Operator-Retoucher; single man only, with highest references.—Apply, " Studio," Henry S. King and Co., 65, Cornhill, London, E.C.3.

SCIENCE for Photographers.—A series of twelve lectures on Elementary Chemistry and Optics, on Friday evenings, at 7; fee, 12s. 6d.—The Polytechnic School of Photography, 309, Regent St., W. First lecture January 9.

Businesses, Premises, and Partnerships.

ABBOTT, BOOTY AND CO., Business Agents, Consulting Photographers and Valuers, 40 years' experience at your service.—11, Clarence Rd., Croydon.

ABBOTT, BOOTY AND CO. offer Businesses in London, Norfolk, Herts, Yorks, Northants, Sussex, S. Wales, Midlands, and Kent.

ABBOTT, BOOTY AND CO. offer a very profitable high-class Business; £10,000 required; suit capitalist or small syndicate.

A HIGHLY successful middle and good class business, country town, 20 miles London; turnover £1,000; tastefully decorated studio, seven-room house, garden; proprietor wishes exchange with similar or approaching concern; must be on or within 30 miles coast; or would buy; strictest investigation given and required.—Box O. 5, 24, Wellington St., W.C.2.

GOOD-CLASS Photographic Studio required at Brighton, with living accommodation preferred; about £300.—Write to Mr. Brabazon, Studio, 34, Grafton St., Dublin.

PHOTO., 19 years' exp., age 36, ex-service man, wants management, branch or otherwise, view to purchase or partnership.—Box O. 4, 24, Wellington St., W.C.2.

SPLENDID opportunity to make money, in most prominent position in Oxford Street, shop and basement, 60 ft. long by 12 and 28 ft. wide, for sale, established 18 years; unique apparatus; low rent, 4½ years' lease to run; Studebaker touring car; price £3,500.—Apply, 37, Oxford St., W.

WANTED, Portable Daylight Studio, in sections, size about 20 x 12 ft., must be in good condition.—Particulars to Bevan, Star Inn, Wick, near Cowbridge, Glam.

Apparatus For Sale and Wanted.

AEROGRAPH Outfit for sale, also ½-pl. Enlarger, for gas.—42, Willow Way, Didsbury.

ALDIS ½-pl. Lens, F. 6, 8-in. focus, in Bausch-Lomb's compound shutter, £8. Houghton's Special Portrait Lens, F. 4, 9-in. focus, Waterhouse stops, £3. Watson Studio Stand, F. 2, £3 10s. Two Backgrounds, 6 x 8 and 8 x 8, 12s. and 15s.—Fitch, Marks Tey, near Colchester.

CONDENSER, 12-in. diameter, new condition; best offer accepted.—Box O. 3, 24, Wellington St., W.C.2.

SOFT-FOCUS Lens, not used, No. 1 Dallmeyer-Berghelm, £7 10s.; seen at " Sinclair," 54, Haymarket, London, S.W.1.—Box O. 2, 24, Wellington St., W.C.2.

SOHO Reflex, brass-bound, teak, Tropical model, 5/4, with reversible back and Goerz Dagor lens, McKenzie Wishart adaptor, scarcely used, £28.—" Upavon," Princes Park Avenue, Golder's Green, N.W.

VOIGTLANDER Euryscope Series III. No. 4A, 11-in. focus, good cabinet or whole-plate group lens; flange stops and hood complete, £6. Gelerry Studio Shutter, for use with same, 25s. Seen by appointment.—Parker, 52, Yerbury Rd., N.19.

WANTED, Cooke Portrait Lens, Series II.A, 15-in. focus.—Berry, Hudson St., Rochdale.

WANTED, Cinema Camera, any make, in repairable condition.—State price and particulars to Rutherford, 85, Alderney St., London, S.W.

WANTED, Cooke Portrait Diffusion Lens, 3.5, Series II.A, 10½-in., with flange, ½-plate and 13 x 18 cm. Negative Storage Boxes, also 12 plate Developing Tanks for same sizes.—Browne, 99, Honor Oak Park, S.E.23.

Apparatus—Trade.

BACKGROUNDS, Backgrounds, Backgrounds. Satisfaction guaranteed or money returned. See big lists, 5 stamps.—Pemberton's, Rishton, Blackburn.

BACKGROUNDS, splendid value. Woodlands, Gardens, Conservatories, Interiors, Sketch. Grounds. 8 x 6, 21s.; 3 x 8 32s.; other sizes. 8 x 6 white grounds, 15s.; designs, 4d.—Hocking, Artist, Church, Lanca.

COMPLETE Set of original Stickyback Apparatus. Camera, one slide to take 60 on, printer seat racks numbering to 500, two dishes, lead-lined tank, pedestal, lens, £25 the lot; Dallmeyer Studio Portrait Lens No. 3B, in splendid condition, £15; Dallmeyer No. 1A Portrait Lens, F. 4, with Waterhouse stops, £10 10s.; Ross Goerz Patent 14in. anastigmat, F. 7.7, with Iris stops, in new condition, £16; Ross No. 6 Symmetrical (8-in.), with Iris stops, £2 15s.; Ross No. 7, Symmetrical (9-in.), with Waterhouse stops, £2 10s.; Busch Lens, Anastigmat Ser. III., No. 2½, F. 7.7., foc. 6 in., in new condition, £3.—Apply, E. Mather and Co., Ltd., 7, Victoria Bridge, Manchester.

PHOTO Microscope by Zeiss or Voigtlander with large 50 mm. tube and accessories wanted. State price and details.—" M.," 52, Cambridge Av., N.W.6.

POSTCARD Panros Focal-plane, Ross F. 6.3, Homo., 3 D.D. slides and case, £14; ½-pl. Ernemann Focal-plane, F. 5.5 Anastigmat Lens, 2 D.D. slides and case, £13 13s. 6 x 4 Goerz Anschutz, latest pattern, Dagor, F. 6.8, 3 D.D. slides, extension back, roll holder and case, £15 15s.; 10 x 8 Field Camera, all movements, 3 D.D. slides, £6 15s; ½-pl. Triple Victo-Beck Sym. Lens, T.-P. shutter, tripod, 3 D.D. slides, £7; 8½ x 6½ Triple Imperial Dallmeyer Lens, 3 D.D. slides, tripod and case, £10; ½-pl. Enlarger, 6-in. condenser, carrier, incandescent outfit, £7; ½-pl. Enlarger, 8½-in. condenser, carrier, and incandescent outfit, £9; 7½-in. Busch Omnar Anastigmat, F. 6.5, £6; 8½-in. Aldis F. 4.5, sunk mount, £9; 6-in. Ross Homocentric, F. 6.3, focussing mount, £7; 17-in. Ross Telecentric, F. 6.4, iris mount, £22; 11-in. Plano convex condenser in mount, £7 10s.—C. Baker, 244, High Holborn, London, W.C.

REPAIRS.—Alterations or Special Apparatus to Specification.—H. T. Ball and Co. (17 years with J. F. Shew and Co.), 51, Berwick St., London, W. Only thoroughly expert workmen employed.

THE Best Market to Buy, Sell, or Exchange Photographic Apparatus; large selection of reliable apparatus always in stock; supplied on liberal approval terms.—Write, stating requirements, to the Westminster Photographic Exchange, Ltd., 119, Victoria St., and 111, Oxford St., London.

VICTOR Bevellers, simplest, quickest, cheapest: Best, 15 25s., 21 30s. net.—Postal address, Victor Co., Enfield Highway, N.

Continued on Supplement 2.

THE RAINES SERVICE have pleasure in wishing you all a really Happy Peace - Time Christmas, and anticipate for you, with the help of the RAINES SERVICE, a really Prosperous New Year.

RAINES & CO.,
The Studios,
Ealing, W.5.

COOKE PORTRAIT LENSES

That freckled face

EVERY retoucher knows the labour involved in connection with freckled and bad skins, the grain may be good, the modelling skilful, yet the resulting print will always betray these facial imperfections, and considerably reduce the satisfaction of the sitter in the portrait.

COOKE PORTRAIT LENSES

provide a remarkable remedy if the diffused focus device (at the front) is used, the degree of diffusion being entirely under the control of the operator. This does not mean loss of definition, but a soft roundness is imparted to the image which is quite distinct, and materially differs from that obtained from the usual portrait lenses.

Have YOU got the Cooke Portrait effect in your photographs?

TAYLOR, TAYLOR & HOBSON, LTD
STOUGHTON STREET WORKS, LEICESTER.
& 62, OXFORD STREET, LONDON, W.1

B. MATTHEWS,
Trade Photographic Works.
Proprietor, A. M. MATTHEWS.

POSTCARD PRINTING
and ENLARGING, &c.
FOR STUDIOS.

"Same Day" Service
for BLACK GLOSSY
BROMIDE POSTCARDS,
In Dozens or Thousands.
At list prices.

REAL
PHOTO VIEW CARDS
For Publishers,
Per 16/- *Gross.*

134-140, IDLE RD., BRADFORD.
Telegrams: "Postcards Bradford."

Illingworth's
BROMIDE PAPERS

Confidence in the materials used is the backbone of success.

Illingworth's Bromide Papers

Give perfect prints with ease and certainty. Are remarkable for their latitude in exposure and may be forced in development.

They are clean in working, free from fog, and do not stain.

T.I.C.
TRADE MARK.

Sole Manufacturers:
THOMAS ILLINGWORTH & CO.,
LTD.,
WILLESDEN JUNCTION, LONDON, N.W.10

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 3112. Vol. LXVI. FRIDAY, DECEMBER 26, 1919. Price Twopence.

Contents.

	Page
Partly by Way of Apology	749
Ex-Cathedra	749
Professional Photography: An Unsuccessful Appeal Against Excess Profits Tax	750
Practicus in the Studio. By Practicus	751
Pinhole Photography. By Edward Lee Harrison	753
Forthcoming Exhibitions	754
Mr. Hugh Cecil's Unsuccessful Appeal Against Excess Profits Taxation	754
The Microscope: Its Design, Construction and Application	755
The Scientific and Technical Group of the Royal Photographic Society.....	755
The Success of British Plates in Switzerland. By E. J. Giomari.....	756
Assistants' Notes.....	756
Patent News	756
Meetings of Societies	757
Correspondence— Objectionable Photographs — Leos-Separation in Stereoscopic Photography of Small Objects on the Same or an Enlarged Scale — Mounting Blocks to Point Measures	758
Answers to Correspondents....	760

The Summary of contents which usually occupies the lower half of this column will be found at the foot of the page overleaf and will be placed there whenever its regular position is required for notices relating to the forthcoming "B.J. Almanac."

Partly by Way of Apology.

The forthcoming "Almanac" is being issued in an edition of 25,000 copies. Owing to the disturbance of photographic conditions during the period of the war, and also to the enforced restrictions in the supply of paper, it was necessary during the last few years to issue only 15,000 copies, a number which we know was a great deal short of the demand.

In restoring the edition to its pre-war figure of 25,000 copies, it would seem that our publishers have taken a somewhat conservative view of the demand for the first post-war "Almanac." Although more than a month has still to elapse before the day of publication, practically the whole of the edition has already been ordered by firms in the distributing trade.

It is therefore necessary that we should make the most definite announcement to those who wish to make sure of obtaining a copy. It requires to be understood that the "Almanac," unlike many other books, is ordered by dealers for chance sale only to a very limited extent. In by far the majority of cases the order to our publishers is based on the individual applications made to dealers for the supply of a copy immediately on publication. Thus, unless this course is followed by the individual purchaser, it will probably be found, on the day of publication, that the copies at a given dealer's are bespoken, and the would-be purchaser is pretty certain to be disappointed.

We would, therefore, ask all those who wish to obtain a copy of the book to place their order now with the photographic dealer, bookseller, or railway bookstall in their neighbourhood. It is particularly requested that these single orders should not be sent to our publishers for execution by post, since the few copies of the edition still remaining undisposed of will probably have been allotted to distributing firms by the time this notice comes before the reader.

EX CATHEDRA.

Import Restrictions Illegal. Photography obtains a fortuitous prominence in the important judgment delivered last week by Mr. Justice Sankey, who has decided that the prohibition of imports into this country by proclamation in virtue of the Customs (Consolidation) Act of 1876 is unauthorised. For the test case in respect to which the judgment was given was one brought by the Crown against a firm of chemical merchants who had imported packages of pyrogallic acid. In seeking to justify the application of the 1876 Act, the Attorney-General, among other arguments, contended that, as pyrogallic acid is used in photography, and as photography is used in war, therefore pyrogallic acid is in the same class of goods as arms, ammunition, and gunpowder, which come within the scope of the Act. We are not interested in stressing the thinness of this argument or in considering the judgment in its relation to a particular photographic requisite. From the point of view of the photographic trade as a whole, it is the large question decided by the judgment which is of importance. Mr. Justice Sankey, in his searching analysis of the history of the Acts concerned, has decided that the prohibition of imports enforced by the Board of Trade is without authority and remains so unless and until the present judgment is reversed by a higher legal Court, or legislation for the same purpose be passed by Parliament. Although the President of the Board of Trade in the House of Commons on Thursday in last week sought to warn importers of the possible effect of coming legislation, the reception of the Anti-Dumping Bill suggests that interference with the channels of trade by the present Parliament is not likely to take any definite form.

* * *

The Colour of the Mount. When only a narrow margin of cardboard was shown round a mounted photograph the colour and depth of tone did not greatly affect the appearance of the print, provided, of course, that vivid colours were not used. In these days, when the mount is usually much greater in area than the print, the colour and depth need more careful consideration, as the common practice of using one tint of brown or grey for all prints often results in spoiling the effect of the work. There are few bromide printers who can guarantee good sepia tones from every class of negative, and much may be done to make a print look its best by using a suitable mounting paper. Even with black and white prints the depth of tone of the mount must be studied, as a delicate pencil-like image may be made to appear washed out by placing upon a dark grey or brown, which would suit a rich print with strong contrasts. A few pieces of various coloured mounting papers and a piece of colourless glass to keep the print flat will enable the most suitable tint to be chosen with the mini-

mum of trouble. A narrow tint mounted under the print sometimes helps to detach the print from the mount, but, as a general rule, such tints are not to be recommended, and they are in consequence falling into disuse.

* * *

Overhauling. Now that the Christmas trade is done with, there is time to take a look round and find what repairs and alterations in studio apparatus are needed so as to be in readiness for the coming season. It is too often the rule to let apparatus go until a breakdown occurs, and if this happens to be at a busy time, much inconvenience and even loss may result. Among the points to which attention may be directed are the re-velveting of camera-backs and dark-slides, the blackening of the inside of the bellows, and the renewal of the pneumatic fittings of shutters. Those who have much trouble with the latter will find the substitution of the "Antinous" wire-cable release for the customary ball and tube to be advantageous. Lens tubes, cells and diaphragms are also all the better for occasional blackening, while the camera stand often needs some little adjustment to insure smooth working. All these things can be conveniently done in the quiet season, when, if necessary, the principal camera can go to the repair shop for a few days without being missed.

* * *

Lighting in Winter. Although most photographers are opposed to "dividing" the light in portraiture, it is sometimes helpful to do so in winter when the light is weak, and reflectors cannot be used effectively. If a rather strong effect of light on the face is required, there will often be a tendency to hardness, and this may, to a great extent, be overcome by opening the blinds at the end of the studio furthest from the sitter. This will give a weak general illumination, which will show detail in the shadows without having the effect of cross-lighting. When lighting approaching the Rembrandt style is used this device will be found very useful. With artificial light a white ceiling or screen fixed over the lamp serves very much the same purpose, an excellent example being found in the "Indirect" model of the reflectors used with the half-watt lamps. Some workers prefer to use a weaker lamp to illuminate the shadow side, but with this there is always a danger of double catch-lights in the eyes and an appearance of cross-lighting generally, which is absent if the indirect light is used. If the studio roof is not white a paper screen or white blind must be placed in a suitable position.

* * *

Flashlight Exposures. It should not be forgotten when taking flashlight negatives that the distance between the flash and the subject regulates the amount of power that is necessary to be consumed to give sufficient exposure—that is to say, when using a powder of which 30 grains will give a satisfactory negative of a head at 5 ft. from the lamp, over an ounce would be required if the flash were removed to six times the distance, or 30 ft. away. This can be seen by examining most flashlight pictures of dinners and meetings, in which the near figures will be seen to be over-exposed, while the more distant ones are almost in darkness. This indicates the desirability of firing the flash as near to the subject as is consistent with even illumination of both sides and keeping the flash out of the field of the lens. Some of the most successful results we have seen have been obtained by firing the flash behind a high screen halfway between the lens and the front of the group. Many photographers, when working single-handed, are in the habit of firing the flash on a level with the camera, of course, at a good elevation, and in this case the shorter the focal length of the lens the more effective will be any given quantity of powder.

PROFESSIONAL PHOTOGRAPHY: AN UNSUCCESSFUL APPEAL AGAINST EXCESS PROFITS TAX.

Those of us who are of the view that there is no reason why a maker of portraits by photography should not rank as a professional man will derive little satisfaction from the judgment of Mr. Justice Rowlatt in the High Court last week. The judgment was given, as will be seen from the report which we quote from the "Times" on another page, in an appeal by Mr. Hugh Cecil against assessment of his profits during the years ended October 31, 1916 and 1917, for excess profits duty. In several respects no better appellant could have been selected from the thousands of photographers in this country. Mr. Cecil is a young University man, who took up photography as a means of livelihood, and established himself in a studio in Victoria Street in November, 1912. Within a very short time he made a name for himself as a leading exponent of what is commonly termed individual portraiture. His work was, and is, recognised as marked by his own personality, and the relatively few sitters whom he photographed and to whom he supplied portraits at a price which, apparently, is higher than that charged by any other photographer undoubtedly sought his services on account of his artistic gifts. In this respect, therefore, it was possible to draw an exact parallel between his work and that of a painter, and evidence to this effect was, indeed, submitted in the course of the hearing by a Royal Academician. On the ground, therefore, of professional status and occupation, opposition to the incidence of excess profits tax could not

SUMMARY.

The Index to the 1919 volume of the "British Journal of Photography" and of the "Colour Photography" Supplement is presented with this issue. Space has not permitted the inclusion of a title-page to the "Colour Photography" Supplement, but the publishers will be glad to send a copy to any applicant.

Beginning with the first issue, January 2 of next year, the price of the "British Journal" will be threepence weekly.

By the judgment of Mr. Justice Sankey last week, given in a case relating to the importation of a photographic chemical, recent restriction of importation of goods into the United Kingdom falls to the ground. (P. 749.)

In the last of the series of articles which have been appearing during the present year, "Practicus" deals with the elements of retouching, advising as to outfit and giving such first hints as are possible for the removal of various descriptions of defect from portrait negatives. (P. 751.)

On the ground of coming within the exemption from excess profits granted to certain "professions," Mr. Hugh Cecil appealed last week to the High Court from the decision of the Income-tax Commissioners—and appealed unsuccessfully. On page 754 we quote from the "Times" the proceedings in the Court, and in a leading article on page 750 are bound to express our disappointment at what seems to us the very inadequate arguments advanced in support of the decision.

The first annual general meeting of the Scientific and Technical Group of the Royal Photographic Society was held on Wednesday in last week, when an administrative committee was elected. (P. 755.)

The favour in which British dry-plates are held in Switzerland is the subject of a note by a Geneva correspondent, M. E. J. Glumart. (P. 756.)

In a recent article in the "Photo-Era," Mr. E. L. Harrison shows how the formula for the size of a pin-hole to be used as a lens is deduced, and gives tables for use in practice. (P. 753.)

A note on the mistake of maintaining too little variety in the colours of mounts will be found on page 749.

A method of mounting prints of extra large size by means of an edging of seccotine is described by a contributor to "Assistants' Notes." (P. 757.)

The distance of the flash-powder from the subject necessarily makes a very great difference in the amount of powder required. A hint as to where the powder may advisedly be placed is contained in a paragraph on page 750.

Wellington

Bromide Papers

Made in an extensive range of grades for every photographic printing and enlarging purpose for which Bromide Papers can be used.

WELLINGTON Bromide Papers became famous for their quality in the early days of the manufacture of bromide papers, and the continuity of that quality is the secret of their popularity to-day.

Complete Catalogue on application.

WELLINGTON & WARD,
ELSTREE, HERTS.

London. Paris. Bombay. Calcutta. Etc.

Johnson's PROFESSIONAL FLASH POWDER

A thoroughly reliable and efficient powder giving a flash of very great brilliancy and actinic power. It is specially suitable for Banquets, Balls and similar gatherings, owing to the minimum amount of dust and smoke. Johnson's Professional Flash Powder is now supplied in 1 oz. and 2 oz. bottles. When ordering, be sure to mention "Professional" quality.

JOHNSON & SONS,
Manufacturing Chemists, Ltd.

Cross St., Finsbury,
LONDON, E.C. 2.

PHOTOGRAPHIC RESIDUES

Our long experience in the treatment of every form of Residues is at the Service of all Professional Photographers. Save your old Fixing Baths and Waste Cuttings, and we will recover the valuable contents and give you the full market value.

Expert advice gratis on application:—

JOHNSON & SONS,
Smelting Works, Limited.

St. Paul's Works,
Paul St., Finsbury,
LONDON, E.C. 2.

conceivably have been offered more effectively than in the person of Mr. Cecil. On other general grounds, which to us seem to be those simply of common justice, there was much to be said in favour of his case. It was shown that during the first two years of his establishment as a portrait photographer—namely, in 1913 and 1914—his work was done at a pecuniary loss; for the year ending October, 1915, his receipts and outgoings balanced each other. During the two following years, and particularly in the second of them, he achieved a substantial financial success, and it was in regard to these two years that the assessment for excess profits duty was made in respect to him, and, presumably, at the rate of 60 to 80 per cent. applying to these periods. From this brief statement it will be seen with what great hardship the excess profits taxation affects those who happen to turn the corner and secure profits from an occupation which for several years previously has been followed without profit or at a loss; at the higher scale of 80 per cent. it means that out of profits of £1,000 the State takes £640, and leaves £360 to the maker of them.

Nevertheless, Mr. Justice Rowlatt was unable to distinguish, from the legal standpoint, between the status of a photographer such as Mr. Cecil and that of an "ordinary trade photographer." He admitted he could not define exactly the word "profession" in the section (39) of the Finance Act (No. 2) of 1915, according to which exemption from excess profits duty could be granted in the case of any profession the profits of which were dependent mainly on the personal qualifications of the person who followed it. For the purpose of the case he adopted the definition that "a man did not exercise a profession unless he exercised an art the profits of which were dependent mainly on his personal qualifications." To our poor uninformed lay mind it seems that he could not have framed a formula more closely descriptive of the occupation which the appellant followed as a means of livelihood; but, after granting that Mr. Cecil "did things in a more elaborate way than an ordinary photographer," he came to the decision that the Commissioners of Income Tax were right in point of law.

We must confess that the arguments contained in this judgment leave us cold. Unfortunately, only the scantiest reports appear in the Press of the defence offered on behalf of the Commissioners of Income Tax in the way of explaining or defining their interpretation of "a profession." Reference seems to have been made to the Law, the Church, and the Medical Faculty, as the three professions in the historical sense, but we imagine it could hardly be seriously contended that these exhaust the list of occupations which in law and in fact are professions. The professions of architect and consulting chemist are two which occur to us as we write, and must, so it would seem, be ranked equally with those of men who deliver their opinions on legal or medical problems. Considering the importance of the case to professional people generally, it is disappointing that no clarifying definition of a "profession" should have emerged from it. From the more restricted standpoint of photographers we can only express our sympathy with Mr. Cecil at the result of his valiant but unsuccessful attempt to introduce a sense of proportion into the mentality of the authorities entrusted with powers of taxation.

PRACTICUS IN THE STUDIO.

[Previous articles of this series, in which the aim of the writer is to communicate items of a long experience in studio portraiture, have appeared weekly since the beginning of the present year. It is not thought possible to continue the series to the length of that by the same writer which ran through the "British Journal" some years ago, but if any reader among the younger generation of photographers, and particularly those engaged as assistants, has a particular subject which might be dealt with, his or her suggestion will be welcomed. The subjects of the previous articles of the series have been as follows:—

A Talk About Lighting (Jan. 3).
The Camera and the Lens (Jan. 10).
Managing the Sitter (Jan. 17).
Backgrounds (Jan. 24).
Studio Exposures (Jan. 31).
Artificial Lighting (Feb. 7).
Printing Processes for Portraiture (Feb. 14).
Studio Accessories and Furniture (Feb. 21).
The Surroundings of the Studio (Feb. 28).
Studio Heating and Ventilation (March 7).
The Postcard Studio (March 14).
The Printing-Room (March 21).
About the Reception Room (March 28).
Home Portraiture (April 4).
Portable Studios (April 11).
Copying (April 18).
Handling the Studio Camera (April 25).
More About Lenses (May 2).
Enlargements (May 9).
Advertising the Studio (May 16).
Mounts and Mounting (May 23).
Business Methods (May 30).
Photographing Children (June 6).
Portraits of Elderly People (June 13).
Something about Lenses (June 20).
Hand Cameras for Professionals (June 27).
The Dark-Room and Its Fittings (July 4).
Plates and Their Work (July 11).
Apparatus Repairs and Renovations (July 18).
Posing the Head (July 25).
Intensifying Portrait Negatives (Aug. 1).
Workshop Jobs (August 8).
The Personal Factor (Aug. 15).
The Keeping of Negatives (Aug. 22).
Reduction of Negatives and Prints (Aug. 29.)
Leaky Roofs (Sept. 5).
Blinds and Curtains (Sept. 12).
Miniatures (Sept. 19).
Printing Portrait Negatives (Sept. 26).
Wedding Groups (Oct. 3).
Combination Printing (Oct. 10).
Flashlight Work (Oct. 17).
Flashlight Portraiture (Oct. 24).
The Question of Outfit (Oct. 31).
Telephoto Lenses for Professional Work (Nov. 7).
Changing Quarters (Nov. 14).
CarbonPrinting—I. (Nov. 21).
Carbon Printing—II. (Nov. 28).
Bromide Wrinkles (Dec. 5).
Natural Poses of the Figure (Dec. 12).
The Reproduction of Negatives (Dec. 19).

ELEMENTARY RETOUCHING.

Although it is difficult to give any useful instruction in retouching without personal demonstration, I hope to be able to outline what may be termed the mechanical side, leaving the student to acquire, by the study of good examples of portrait work, painted as well as photographed, that artistic knowledge which will enable him to apply his technical skill to the best effect. I would, however, caution the beginner against attaching too much importance to the "before" and "after" retouching examples which are reproduced in most books on retouching, as not only does the half-tone process destroy the character of the original work, but, as a rule, in order to demonstrate his powers, the artist usually puts on a great

deal more work than is desirable in ordinary practice. Negatives are sometimes so perfect that no retouching is necessary, and the nearer a retouched negative can approach this ideal the better.

The appliances necessary for retouching are simple and inexpensive: a retouching desk, a bottle of medium, two or three pencils, a glass paper-block, some spotting colour and one or two fine sable brushes, and a retouching knife.

Next to the pencils, the desk is the most important item in the outfit, and if the beginner cannot afford to buy a fairly large and substantial desk, he will do well to make a rough one by taking a shallow box about 18 ins. square, such as is often used for packing large negatives in, cutting a hole 3 ins. square in the lid and hingeing it to the body. Struts must be fitted so that the negative stands at an angle of about 60°, and a black cloth hood, supported by a wire or cane frame attached so as to exclude all light except that passing through the negative. I specially caution the novice against using the small desks a foot or less in width, which are listed by most dealers.

A reflector of white card or opal should be so placed that when looking through the opening in the desk it is evenly and well illuminated. When dealing with very dense negatives, a piece of looking-glass may be used as a reflector, but care must be taken to place it at such an angle that only clear sky is seen through the negative. If window sashes or other obstructions intervene, they are likely to cause uneven work. When working at night or in foggy weather, a lamp must be used, but a piece of ground-glass must be placed between the frame and the negative, so that the flame cannot be seen. When electric light is available, it will, of course, be used, but in this, as well as with an oil lamp, a piece of thin bluish paper should be placed under the negative to "cool" the light. An engraver's globe filled with water, tinted blue with nitrate of copper, gives an ideal illumination. Incandescent gas requires no blue screen.

The pencils should be fitted in ever-pointed holders, and three grades are usually employed. Before the war the best leads came from Vienna, and the numbers most in use were 2 (rather soft), 3 (medium), and 4 (hard). The English leads which have taken their place are sometimes marked with the ordinary grades, B., H.B., and H., which correspond approximately with 2, 3, and 4; but sometimes they are not marked at all, so that a trial is necessary to ascertain what you have got hold of. The pencils should be brought to a very fine tapering point, using first the glass-paper block and finishing on a piece of hard drawing paper or even brown paper. While working, a touch on this paper to free the point from medium may be occasionally required. The No. 3 or H.B. grade is the best for a beginner, although an expert retoucher can work more quickly with a softer pencil. Retouching medium is a varnish-like compound, and is needed to give a "grip" to the surface of the gelatine, which is usually too smooth to take pencil. There are several good varieties, the best known being Autotype, Ellis's, and Winsor and Newton's, all of which I can recommend from experience.

When removing negatives from the washing water, they should always be wiped or swabbed with a pad of cotton-wool or a wash-leather, so as to remove any lime or other sediment adhering to the surface. If this be not done, the medium will make the negative more transparent where it is applied, and this will show in printing. Intensified negatives should be covered all over with medium for the same reason; in fact, it is a good practice to coat the entire surface, as it is a very fair protection from the atmosphere. It often happens, when a re-order is wanted from a rather old negative, that it will be found to have faded everywhere except where the medium has been applied.

The medium may be applied by moistening the cork of the bottle by inverting it and then touching the cork with the tip of the finger, which is gently rubbed on the parts to be retouched, but a better plan is to use an old silk or linen handkerchief, a small piece of which is damped with the medium and rubbed on the film, the edges being softened off to avoid a mark in printing. Very little medium is necessary, but it must not be polished off too well. In case it is necessary to remove the medium, and, of course, any retouching upon it, this may be done with a soft rag and spirit of turpentine.

Half an hour or more after applying the medium the negative will be ready for working upon, and the first step is to stop out with the sable brush and a little Indian ink and carmine any clear pinholes or circular marks caused by bubbles in the development. Small holes may be filled with a single touch, but larger ones must be finely stippled. It is sometimes recommended to use "opaque" for this work, but I have found it too opaque for use on half-tones. The colour must be applied as nearly dry as it will leave the brush, or it will run on the surface. A very little gum may be added to give a better consistence to the colour if any difficulty is found in this way.

Freckles and all similar defects must be treated with the pencil only, and here we begin to understand that what retouchers call a "touch" is necessary. For freckles, small curved marks sometimes compared to a comma without the dot are often used, but a sort of tangled line made by keeping the pencil on the surface and moving it in small circular touches is sometimes better. Do not attempt to stipple in dots with a pencil, as this takes an enormous time and is not as effective as lines. Do not overdo the touching of freckles: it is better to leave a ghost of them than to substitute a white freckle for the dark one.

Wrinkles are, as a rule, best treated by short, soft interlacing lines following the direction of the wrinkle itself. Never work across a wrinkle or other line in the face. Where shadows have to be lightened, the circular or comma touch may be used; but it must not be allowed to degenerate into the kind of fish-scale texture frequently seen in beginners' work. An expert retoucher will often appear to be scribbling aimlessly on the negative, but in reality he is varying his touch to suit the texture of different parts of his subject, and this object must always be kept in view by the beginner.

Due consideration must be given to the age of the sitter. Children's faces may be smoothed to any extent; young people's almost the same; but as age approaches we must endeavour to preserve the character and to soften the lines and skin texture without destroying them. With elderly ladies we may perhaps rejuvenate them a little, but not at the expense of likeness.

A common failing with beginners is "spotty" working; that is to say, the face shows a number of worked-up areas with spaces between. To avoid this, the retoucher must not dodge about the negative, doing first one feature and then another, but work right down the face from top to bottom, not necessarily pencilling it all over, but doing what is needed as one goes on.

In present-day retouching the knife or scraper plays an important part, as by its use not only lights but shadows can be put into a negative. Awkward outlines of face, neck, and arms may be corrected, large ears reduced, noses straightened, and many other modifications effected which could formerly be done only upon the print. Space does not allow me to deal with this phase of retouching, and for its study I would refer the reader to the new edition of Johnson's "Art of Retouching," which is the most complete work on the technics of the art which has been published.

With the present issue, "'Practicus' in the Studio" comes to a finish. "Practicus" will hibernate for a time, but hopes later on to renew his discourses when opportunity arises.

PRACTICUS.

Imperial Notes

Copyright.] London, December 26, 1919. [All Rights Reserved.

Editorial.

"Man, know thyself!" The Greeks accounted this saying of Solon, "Know thyself," as worthy to be inscribed upon the ancient temple of Delphi.

Really we know very little about ourselves. A gentleman of the name of Snook astonished his friends by proving that he, at least, understood what his *name* meant. Snook, it appears—a true British name, albeit not perfectly enphonious or picturesque—has as its derivation the quite pleasing name "Seven Oaks." The original Snook, you see, had dwelling nigh unto the Seven Oaks, in some delightful old-world village or other. After him, it appears, came "Sennoks," and thus later "Snook."

Do you know what *your* name means?

The Normans appear to have given us all our best names. It is not until after the Battle of Hastings that we hear of our ordinary and usual names. After the coming of the Normans we learn of the Roberts, Richards, Rolands, and Milesses (a soldier) with various modified forms. Thus from Robert came Robertson, Robbins, Dobbins, Dobbs, Dobbinson, and Dobson. Richard passed on to us the Richardsons (the sons of good Richard), Richards, Ricks, Dick, Dixon, Dickens, Dickenson, Hicks, Higgins, and even Hitchcock ("cock" meaning a pert or impudent young fellow).

Another name more prominent about this time appears to have been John, Johnson, and the derivative Jones (the host of sons of sturdy John). This fine name in its various other forms of Jenks, Jenkins, Jennings, Jack, Jackson, Jacox, the Welsh name Evan or Evans, and the Flemish Hanson, Hankins, Hancock, and Little-John, gives the Smiths a really hard race to keep first place.

Outside of "son," one of the most fertile sources of our family names must have been the nickname given in recognition of some good quality, or for a worthy or noble disposition. What finer names can there be than those which pass down for ever the inherent good qualities of those who bore them first?

Take but a few examples: think of the dispositions of the first good fellows who were named Noble, Swift, Goodman, Wise, Sage, Just. Visualise for a moment the first proud bearers of the names Armstrong, Strong, Doughty. Though the bad that men do lives after them, the descendants of men called by their fellows Noble and Good need not feel that they possess undesirable names.

And now for a moment think of the name of a *product*—yes, of a famous and universally bought and praised photographic plate—IMPERIAL. This name has its meaning. Look it up, pray, in your dictionary.

THE IMPERIAL DRY PLATE CO., LTD., CRICKLEWOOD, LONDON, N.W.2.

IMPERIAL FLASHLIGHTS

THE FASTEST PLATES IN THE WORLD

FOR dull weather photography "Flashlights" are invaluable, as by their aid it is possible to make satisfactory pictures under the worst conditions. They are not only high in speed, but they possess also those unique properties which have for nearly a quarter of a century been associated with Imperial plates, and which are known as

IMPERIAL QUALITY

SPEED!

Speed is the vogue of the hour. We whiz by train at sixty miles per hour, and by aeroplane we would fain fly at ninety. And for winter photography—why, *Speed* is still what we need and want. And why not, if you can have quality too?

For every want there is an Imperial Plate—and always, plus, the unequalled *Imperial Quality.*

For fine fast workers who want fine fast plates we supply the now famous Imperial Flashlight. Speed 400, plus unique *Quality* Imperial Flashlight Plates are sold in their hundreds weekly to London's leading Press Photographers and Flashlight Experts. Never have we known the sales of Imperial Flashlight Plates to be so heavy as at the present time. Fine proof for you, if proof were wanted, that "Imperial *Quality Counts!*"

As the name Flashlight implies, the plates are of exceedingly high speed, fast enough for fine photography, and nearly fast enough for freak-fast photography. Workers of experience who use these plates say that for speed, consistent with really high-grade quality, no plates in the world can equal Imperial Flashlight.

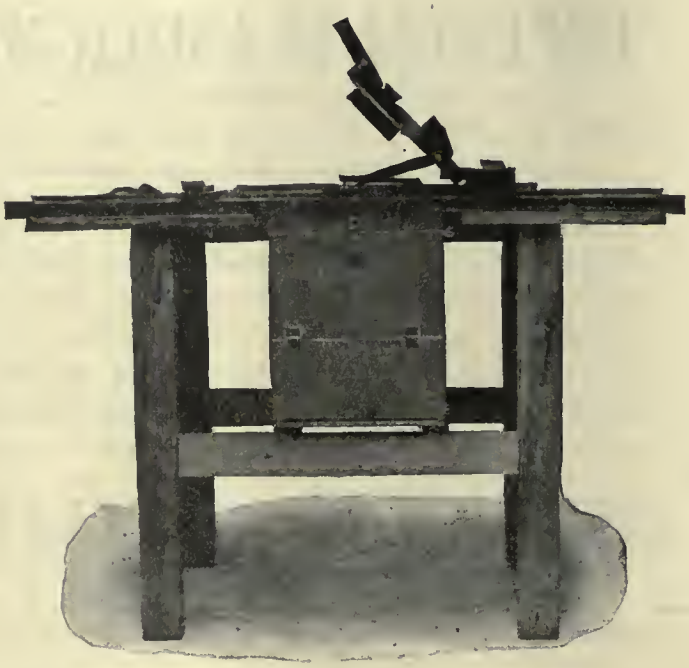
Remember, please, the speed is 400 H. and D. with Imperial QUALITY PLUS.

WHAT DOES YOUR NAME MEAN ? ? ? ?

See Editorial on this page and please do not omit the dictionary experiment.

A "PAWL" Printer

PRODUCES PERFECT PRINTS, QUICKLY.



Price List

"Pawl" Bromide Strip-Printing Machine, complete for electric light **£10 10s.**

Do. do. for gas **£11 15s.**

The table shown in the picture above costs **42s.** extra for either machine.

ENSIGN TRADE MARK CAMERAS AND SUPPLIES

THERE is nothing you need for your workrooms so much as a "Pawl" Printer. The money you save in time and materials—both very expensive items in these days—soon pays for the cost of a "Pawl." Your assistants will be delighted with it because the "Pawl" Printing methods enable them to get through their work so rapidly and with so little bother.

To the Professional Photographer who cannot get all the assistants he could do with, the "Pawl" Printer is a veritable blessing. It enables the short staffed studio to work happily and sweetly even during a busy rush.

Will you come and let us show you what "Pawl" can do ?

If your business is a big one you can use half-a-dozen "Pawls" profitably.

If your business is a small one then "Pawl" will help you to make it bigger.

If your business is a "one-man" concern you can double your output and save yourself no end of time. One man and a "Pawl" can get through no end of work. Why not get one now ?

HOUGHTONS LTD.,
Professional Department,
88/89, High Holborn, W.C., 1.
70/88, York Street, Glasgow,

WE CAN SUPPLY THE ELECTRIC MODEL FROM STOCK.

PINHOLE PHOTOGRAPHY.

[Those who take an interest in lens optics, and also in the making of photographs, will appreciate the motive which has prompted the contribution of the following article to the Boston journal, "Photo Era." Mr. Hamson usefully traces the derivation of Rayleigh's formula for the size of the pinhole, and shows by the photographs which our contemporary reproduces that pinholes made in approximate accordance with it are very satisfactory in practice.—EDS. "B.J."]

FIVE thousand years ago the Egyptian astrologer, standing at the bottom of his stone observatory shaft, situated with mysterious precision in the side of a mighty pyramid, studied the celestial image thrown upon his tablet by the converging rays from an orifice in the stonework. That he made use of the data afforded by this primitive camera is certain. And there is reason to believe also that some sort of photographic impression was retained for reference.

The Babylonian, with his special genius for astronomical observation, also made use of the "pinhole camera," and we find a record of an elaborate contrivance of the kind built for celestial observation at Nimrud.

The Phœnician carried the invention to Carthage; Rome seized upon it, and the necromancer of the Middle Ages revelled in its possibilities, albeit he looked upon it essentially as a means to cajole the ignorant.

Yet the chief astronomers of England and France did not so consider it, and volumes have been written by learned scientists upon its principles and their application.

Lord Rayleigh was fascinated by the subject and devoted much time to study of the pinhole and its properties. Indeed, most of the formulæ and tables given herein are worked out from his calculations.

Many interesting articles have been published in the photographic journals regarding pinhole photography, yet the matter does not appear to have been regarded in any light other than as an interesting experiment, and its real possibilities and the scientific principles which underlie its operation have not been featured. As a matter of fact, the pinhole, properly made, is an exceedingly useful addition to any artist's photographic equipment.

An effort may therefore well be made to supply complete data concerning the methods and apparatus used in making them.

The chief characteristic, and, likewise, the principal advantage of the pinhole, is its universal focus and its extraordinary angle of view. Its chief drawback is that time exposures are required. Undoubtedly, the first consideration in the manufacture of such a "lens" is to obtain the maximum definition. When made properly, this instrument will produce work not dissimilar to a first-class semi-achromatic objective, rendering definition sufficient for general purposes.

For the size of the aperture we shall have reference to Lord Rayleigh's formula, and shall endeavour to indicate the calculations and give data for the most useful focal lengths. After having given the theory of the case, we shall show that the apertures given by the scientists may be reduced about 20 per cent., with consequent increase in sharpness of image, and indicate the reason therefor.

The wave-length of blue-violet light, which is the chief light to be photographically considered, is approximately .0004 millimetre.

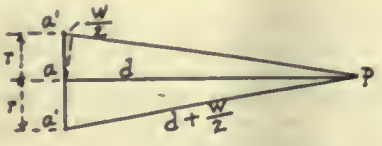


Diagram A.

Now, in order that the light-wave may pass through the lens-orifice without rebound or diffraction, Lord Rayleigh deduced a formula, which is appended, together with a table of openings worked out from this formula (see diagram A).

The limit of retardation of light being taken at $\frac{w}{2}$, w being the wave-length of photographic light, = .000016 inch, or .0004 mil.

r = radius of pinhole.

d = focal length.

$$r = \sqrt{d\,w}$$

$$\text{and } d = \frac{r^2}{w}.$$

Therefore, the distance from the pinhole to the plate-square of the radius divided by the wave length, say .0004 mil.

$$a\,p = d + \frac{w}{2}$$

$$\text{Angle } a\,d'p = \text{right angle.}$$

$$r^2 + d^2 = \left(d + \frac{w}{2}\right)^2 \quad \text{(Euclid 1, 47).}$$

$$\text{Therefore } r^2 = \left(d + \frac{w}{2}\right)^2 - d^2.$$

$$d^2 + dw + \frac{w^2}{4} - d^2 = d\,w.$$

$\frac{w^2}{4}$ is very small and may be omitted,

$$\text{therefore } r = \sqrt{d\,w}.$$

$$\text{and} \quad d = \frac{r^2}{w}.$$

Therefore, distance from pinhole to plate = sq. of radius + length of wave.

This will give a table for the various focal lengths as follows:—

TABLE B.

Needle Number.	Diameter in inches.	Focal Length.	Diaphragm. f. system.
1	1/22	32 in.	700
2	1/23	28 in.	640
3	1/26	23 in.	600
4	1/28	20 in.	560
5	1/31	18 in.	460
6	1/34	13 in.	440
7	1/37	10 in.	390
8	1/44	8 in.	350
9	1/49	6 in.	290
10	1/54	5 in.	270
11	1/60	4 in.	250

Dr. Miethe's formula gives similar results. Yet a practical test will soon demonstrate the possibility of reducing the apertures some 20 per cent., with increase in quality of definition. The most probable explanation of this seems to lie in the supposition that the "pinhole lenses" used by the scientists were drilled straight through a thin sheet of metal, whereas those used by the author were drilled straight through and afterwards reamed to a knife-edge, therefore avoiding rebound and consequent diffraction. At any rate the best results were obtained with the sizes given in table C.

TABLE C.

Focal Length.	Pinhole-Aperture for Maximum Definition.	Allowable Limits.
3 in.	1/100 in.	1/70 to 1/120
3½ in.	1/90 in.	1/65 to 1/110
4 in.	1/80 in.	1/60 to 1/100
5 in.	1/75 in.	1/55 to 1/95
6 in.	1/70 in.	1/50 to 1/90
7 in.	1/65 in.	1/45 to 1/85
8 in.	1/60 in.	1/40 to 1/80

The pinhole objective, once completed, will permit the use of any form of camera. The reflecting camera may be utilised by making a twin lens, with one opening of the regulation pinhole-

size, and the other about 1-16th of an inch in diameter for focussing.

There is no doubt that really excellent and, in some cases, unusual results can be obtained with the pinhole in the hands of a competent photographer. Recently the second prize in a southern competition was won with such means, the judges thinking they were awarding the prize to the possessor of a high-grade semi-achromatic lens.

Landscapes with a lacy foreground and excellent perspective may be obtained if the day is not windy. For architectural work the absolute rectilinearity, the uniform definition and extensive angle of this natural "lens" are very desirable.

Another advantage grows out of the twenty or thirty seconds exposure that are required. A picture in congested regions may be made with calm disregard of the passing public, as they will not be recorded on the plate.

As the size of the image varies directly as the focal length, we find:

$$\text{Size of object} \div \text{by } \frac{\text{dist. obj. to pinhole}}{\text{dist. plate to pinhole}} = \text{size of image.}$$

Example: Focus 6", object 30' distance, 10 feet high.

$$120'' \div \frac{360}{6} = 2'' = \text{Height of image.}$$

Regarding wide-angle work, a 3½-in. focus lens on a 10 x 8 plate yields an angle of 142 degrees, which compares favourably with the best wide-angle lenses. However, the lens must be perfect, and mounted specially to get this extreme angle.

Exposures are not difficult to figure out, but can scarcely be guessed. Instituting a comparison between an $f/4.5$ lens and a pinhole 1/50 in. in diameter, we have:

$$\left(\frac{9 \times 50}{4.5}\right)^2 = 10{,}000$$

or the number of times we must multiply the exposure required of an $f/4.5$ lens. We will assume that the time is 1/300 second for the latter in good light. This would give a value of 33 seconds, which is a little excessive in good light—due possibly to the fact that no glass lenses are employed and the light travels absolutely unobstructed to the plate. Reduce this exposure about one-third, giving 22 seconds, and it will be found about right for the same conditions as justify an exposure of 1/300 seconds at $f/4$ with a fast anastigmat lens.

Regarding the effect of diffraction mentioned above, the author has been unable to discover any trace of this phenomenon in pinholes as small as 1/75 of an inch, the image continuing to grow sharper to this limit, and remaining virtually unchanged to 1/100 in., beyond which noticeable loss was shown.

When using anastigmat lenses, the matter is different. Not so very long ago we tested the matter. Knowing that with smaller stops sharper definition and greater depth of focus were obtained, we decided that if a little was good, more would be much better, and made a number of architectural photographs with a stop of about $f/560$, with results which closely resembled an earthquake in a fog. Upon consulting the authorities mentioned above, we found they had collected all this long before we began, and the allowable limit is set at $f/72$, or thereabouts. At this juncture in our proceedings we returned the volume to the public library, with our benediction. Sometimes science is very annoying. It has no sense of humour at all.

EDWARD LEE HARRISON.

FORTHCOMING EXHIBITIONS.

December 20, 1919, to January 24, 1920.—Scottish Photographic Federation. Sec.: John Macdonald, 27, Aberfeldy Street, Dennistoun, Glasgow.

MR. ELWIN NEAME'S NATURAL BACKGROUND.—A batch of specimens of the portraits by Mr. Elwin Neame in which the background is introduced artificially at the time of making the exposure on the sitter are reproduced in the December number of "Pearson's Magazine." In the course of a short article, entitled "The Tank That Takes Photographs," a popular and non-technical description is given of the outwardly visible *modus operandi* by which the combined portrait and landscape are produced.

MR. HUGH CECIL'S UNSUCCESSFUL APPEAL AGAINST EXCESS PROFITS TAXATION.

[In the King's Bench Division of the High Court on Wednesday last, December 17, before Mr. Justice Rowlatt, the appeal of Mr. Hugh Cecil against assessment for excess profits duty by the Commissioners for Income Tax was heard. The following report of the case and of Mr. Justice Rowlatt's judgment are quoted from the "Times" of December 18.—EDS. "B.J."]

The appellant appealed, by case stated by Commissioners for the Special Purposes of the Income Tax Acts, against assessments to excess profits duty made on him by the Inland Revenue Commissioners under the provisions of the Finance (No. 2) Act, 1915, Part III., and subsequent enactments. The assessments were £280 4s., less £112 18s. deficiency in the prior accounting periods—namely, £167 6s. net duty charged for the accounting period from November 1, 1915, to October 31, 1916; and £1,230 10s. for the accounting period from November 1, 1916, to October 31, 1917.

The sole ground of the appeal was that the appellant claimed that he came within the exemption from excess profits duty accorded by Section 39 (*e*) of the Finance (No. 2) Act, 1915, in the case of any profession the profits of which were dependent mainly on the personal qualifications of the person by whom the profession was carried on, and in which no capital expenditure was required, or only capital expenditure of a small amount.

The appellant's name was Hugh Cecil Saunders, and he carried on business as a photographer in Victoria Street, S.W., in the name of Hugh Cecil. He began business without any capital, and had never had any, as little or none was required by him. He did not advertise. Photography had always been his hobby. As an undergraduate at Cambridge he was interested in it from an artistic point of view, and he exhibited there with success. Later, he was elected a Fellow of the Royal Photographic Society, and a member of the London Salon of Photography, which held exhibitions at the rooms of the Society of Painters in Water-Colours. The studies exhibited were not of a commercial nature, but were sent by persons who treated photography as an art. The photography trade did not submit work to the Salon.

After leaving Cambridge the appellant had no occupation, and his friends suggested that he should take up photography as a means of livelihood. In November, 1912, he took a studio in Victoria Street. He worked at a loss during the first two years of his venture. In October, 1915, his receipts and expenditure were about even. Then—as his work became known—his *clientèle* increased. He did not take a great number of photographs, as he devoted more time than was usual to his work. His charges were high—from 8½ guineas to 10 guineas for a single copy. That was because he studied the sitter and composed the picture in his mind. Then he settled the pose, arrangement, and light and shade, exactly as an artist would do. Some of his best portraits were made with a 5s. camera and a 5s. lens. He always took the photograph. The work was very tiring, and he could only do four or five in a day.

He employed a retoucher, but for the most part he himself did the printing on bromide paper. If a copy were required he would not necessarily do it himself. Usually his work was finished when he had prepared and retouched the negative. He had eight employees—five technical and three clerical. Two of them did the mounting. His total salary bill was from £800 to £1,000 a year. In his absence the work came to a standstill. He had two private residential flats, which constituted the studios.

In 1915 he got a window on the ground floor, which served as a large show-case to display his work. His name was inscribed over the window.

The Royal Photographic Society elected Fellows for technical knowledge or for artistic accomplishment. The appellant had none of the former, but his specimens proved that he had the latter. The Salon included only individuals who produced work of art. The appellant had done one small portrait for four guineas, but he declined to do the ordinary trade photograph.

Evidence on behalf of the appellant was adduced to the Special Commissioners. The Hon. John Collier said that the appellant's work showed great artistic feeling, merit, and individuality; that there was a great distinction to be drawn between the appellant's pictures and ordinary photographs. The appellant in taking one of his photographs followed exactly the same lines that he (Mr. Collier) would follow in painting a portrait.

You must use Portrait Film to know its superior qualities. Try it on a difficult subject — shoot across the light, or even into the light — and you will get good results with

Eastman Portrait Film

Prices—

5½ × 3½ 4/- per doz.	8½ × 6½ 9/6 per doz.
6½ × 4¾ 5/- per doz.	10 × 8 16/- per doz.

12 × 10 23/6 per doz.

Kodak Ltd., Kingsway, London, W.C. 2.

AKRON

"The Surest Dry Mounting Tissue Extant"

THE END OF THE WORLD

contrary to the belief held in various quarters has NOT arrived.

Therefore your need for materials is the same as usual. Perhaps even—as some people consider they have a new lease of life—it may be greater.

To avoid trouble therefore in your mounting department and consequent loss of valuable time and money, to say nothing of spoilt prints, see that your dry mounting tissue is of the finest quality.

In other words see that you have a stock of AKRON, which can be relied upon until the world really *does* end.

AKRON products may be obtained from all Wholesale Houses.

AKRON MANUFACTURING CO., 569, HIGH ROAD, TOTTENHAM, LONDON, N.17.

"THE SERVICE THAT SATISFIES"

OUR PRICES may be slightly higher—but—you are CERTAIN of good, CLEAN, ARTISTIC work of a distinctive quality and an absolutely reliable DELIVERY!

BROMIDE ENLARGEMENTS.

Size.	Unmounted.		Dry Mounted on P.S.M. and well Spotted.		Dry Mounted on P.S.M. and Aerograph finish.	
	Black.	Sepia.	Black.	Sepia.	Black.	Sepia.
8½ x 6½	1/-	1/4	2/-	2/6	2/9	3/3
10 x 8	1/6	1/9	3/3	3/9	4/-	4/9
12 x 10	1/9	2/3	4/-	4/6	5/-	6/-
15 x 12	2/6	3/-	5/9	6/3	6/9	7/6

HIGH-CLASS SKETCHES, Enlarged or Contact

Size.	Black and White.			Sepia.		
	1	6	12	1	6	12
6 x 4	1/2	5/6	10/6	1/4	6/6	12/6
8 x 6	1/6	8/6	16/6	1/9	9/6	18/6
10 x 8	2/6	13/-	25/-	3/-	16/6	32/6

PANEL ENLARGEMENTS.

Size.	Black & White.	Sepia.
10 x 6	3/9	4/6
12 x 7½	5/-	6/-
15 x 10	7/-	7/6

POST CARD PRINTING, 1/10 B. & W.; 2/4 Dozen, Sepia.
RETOUCHING CABINETS, 1nll, 4d.; small head, 6d.; large head, 9d.
Your copy of Price List is waiting. Send o Post Card to-day.

MARSHALL & CO.

MANSFIELD ROAD, NOTTINGHAM.

TO THE TRADE
AND
Publishers of Local Views.

P. A. BUCHANAN & CO.

are now in a position to supply
BEST QUALITY
CREAM SEPIA, COLLOTYPE & GRAVURE

POST CARDS and VIEWS.

Single 1,000's .... **30s.** to **32s.**
Series of Six or more .... **29s.** to **30s.**

DELIVERY IN 4 WEEKS GUARANTEED.

Estimates given for all kinds of View Books, &c.

P. A. BUCHANAN & CO.

Photographers and Publishers,
HEATH LODGE, THORNTON HEATH, CROYDON,
Telephone: 976 Croydon. **SURREY.**

VITEGAS

CREAM CARD 7B.

This is a really delightful cream-tinted card, a colour which makes you realise peace has broken out—such a contrast to the violent creams we had to put up with during war time.

The warm black colour of a "straight" VITEGAS print on 7B Cream is most attractive. Make a window show of it.

Samples gladly to Professionals.

KOSMOS PHOTOGRAPHICS LTD., Letchworth, HERTS

APPARATUS—TRADE (continued).

SERVICE COMPANY (LONDON), LIMITED, for New and Second-hand Professional and Press Cameras of every description; complete studio furnishers; studio outfits bought for cash or taken in part exchange for other goods.

SERVICE.—Wanted at once, 12 x 10 Studio Outfit, complete; must be in good condition, with first-class Portrait Lens and stand; any reasonable offer entertained.

SERVICE.—1-1-pl. Hare studio outfit, double extension, 1-1-pl. repeating back, with 4 slides; ½-pl. ditto, with 2 slides; these backs are interchangeable; first-class Portrait Lens, silent movement, single pillar studio stand by Watsons, inside bellows, shutter, ball and tube release. The whole offered in excellent order for £13 10s.

SERVICE.—15 x 12 stand outfit by Brown, double extension, reversing back, offered with 3 double book-form slides and first-class R.R. Lens for 12 guineas.

SERVICE.—Bromide and Gaslight cards, best quality; all surfaces in stock, as used by most professionals; sample hundred, 8s. 6d.

SERVICE.—No. 1 Empire Cinematograph by Butcher, maltese cross in oil bath, silent running; complete outfit with Westminster arc 100-volt motor and adjustable iron stand, the whole offered for 24 guineas. Exceptional bargain.—289-293, High Holborn, London, W.C.1. 'Phone, Holborn 6430. 'Gram "Admittedly," London.

WANTED, ¼-pl. and ½-pl. Enlargers; also vest pocket cameras and triple extension cameras; best prices given for all apparatus, and prompt payments.—Watson's, 84, High St., Sheffield.

Materials.

Plates, Papers, Postcards, Mounts, etc.

A QUANTITY of Bromide Paper, all surfaces, to clear; good brilliant paper; genuine bargain prices, 12 x 10 27s. 6d., 10 x 8 20s., 8½ x 6½ 13s. 6d., 6½ x 4¾ 7s. 6d., 6 x 4¼ 6s. 6d., 5½ x 4 5s. per gross; c.w.o. only.—Charles Hunt, 15, Hillcrest Rd., Acton Hill, W.3.

ARRIVED, Bromide Postcards, all surfaces, Glossy Gaslight Postcards, 1,000 35s., 500 18s., 100 4s. 6d. Half-plates, speed 300, 44s. gross, 4s. 6d. dozen. Whole-plates, Ultra Rapid, 7s. dozen. Glossy Gaslight Paper, cabinet 6s., ¼-pl. 5s. 6d., 1/1-pl. 7s. 6d. ½ gross. Satin Bromide Paper, ¼-pl. 5s., 1/1-pl. 7s. 6d. ½ gross. All post free.—Wilson's, Chemists, Wigan.

ATTRACTIVE Business, Stationery.—Write for samples and prices, Roman, Wilton St., Bradford.

ALL Materials offered by us in these columns are guaranteed fresh; you run no risks in sending your orders to us; remember, we are an old-established firm with a proud reputation to uphold; all orders dispatched same day; satisfaction guaranteed.—Burt & Co.

BANHAM'S Brilliant Bromide Paper.—Glossy 2nds, cabinet size, 3s. 6d. gross, or special quarter gross sample packet, 1s.; cash with order; carriage paid.—Banham, Chemist, Hitchin.

BROMIDE Postcards, glossy singles only, 35s. per thousand. Matt and Semi-matt in strips, 40s. per thousand, or 10,000 lots 35s. per thousand. Cash with order. Carriage paid per goods train.—Banham, Chemist, Hitchin.

BROMIDE Papers, clearing to prepare for New Year's stock; highly recommended; genuine bargains; no rubbish offered; you may have a sample if you wish; prices above.—Charles Hunt, 15, Hillcrest Rd., Acton Hill, W.3.

BROMIDE Postcards, Glossy or Satin, 100 4s. 6d., 500 20s., 1,000 38s. 6d.; strips, 6 on, 1,000 40s. post free.—Lennotype Photo Co., Bearwood Rd., Smethwick.

BROMIDE Paper, in rolls, 10 ft. x 40 in. 9s.; 25 ft. x 40 in. 20s.; Amidol, 2s. 3d. oz.; Metol, 3s. 9d.; Monomet, 3s. 6d.; post free per return.—Burt & Co.

BROMIDE Paper, matt, satin, and glossy, splendid quality, giving pure blacks, clean whites, and beautiful tones, 3½ x 2½ 3s. gross, ¼-pl. 4s., 5½ x 3½ 5s., 5½ x 4 5s. 6d., 5¾ x 4 5s. 9d.; 6 x 4¼ 6s. 6d., 3s. 9d. ½ gross; ½-pl. 7s. 9d. gross, 4s. 6d. ½ gross; 8 x 6 12s. gross, 6s. 9d. ½ gross; 1/1-pl. 14s. gross, 7s. 9d. ½ gross; 10 x 8 18s. gross, 9s. 9d. ½ gross; 12 x 10 36 sheets 8s., 28s. gross; 15 x 12 24 sheets 8s., 41s. gross; 20 x 16 12 sheets 7s. 9d., 71s. gross; 20 x 16, rough, 12 sheets 6s. 9d. Post free per return from the firm with a reputation for quality.—Burt & Co., 45, Monument Rd., Birmingham.

BIG Adverts. cost big money. Our method of advertising is to satisfy our customers. We have been doing this for the past 10 years, and we find this method gives the best results.—Burt & Co., 45, Monument Rd., Birmingham.

DUPLICATE Books for all purposes.—Write for particulars, Roman, Wilton St., Bradford.

ECONOMY Campaign.—Buy Banham's Brilliant Bromide Bundles, 5s. each, carr. paid. Bundle 1: Seconds, Bromide Paper and Card, in assorted surfaces and sizes up to half-plate. Bundle 2: Similar, but sizes larger than half-plate. Bundle 3: Seconds, Vigorous Gaslight Paper and Card in assorted surfaces and sizes up to half-plate. Bundle 4: Similar to 3, but larger than half-plate. Excellent value. Money refunded if dissatisfied.—Banham, Chemist, Hitchin.

FRAMES.—20 x 16 Solid Spoon Oak, 2-in., with ¼-inch best slip, 52s. doz. You can buy cheaper, but not better. Other sizes proportionately.—Straw, Short Wyre St., Colchester.

FRAMES.—20 x 16, 2-in. Spoon Satin, 24s. per doz.; sample mouldings 6d.; refunded with first order; keenest water-colours in the trade.—Cooper & Barnett, 6, Erskine St., Vauxhall, Birmingham.

GASLIGHT or Bromide Cards, splendid quality. All surfaces, 4s. 3d. 100.—Crossley, 3, Queen St., Dukinfield.

GASLIGHT Paper (superior quality).—3½ x 2½ 3s. 6d. gross, 3½ x 3½ 4s. 6d., 4½ x 2¾ 4s. 6d., ¼-pl. 5s., 5½ x 3½ 6s., 6 x 4¼ 7s. 6d., ½-pl. 8s. 6d. gross, 4s. 9d. ½-gross; 8 x 6 12s. 6d. gross, 7s. ½-gross; 1/1-pl. 14s. gross, 7s. 9d. ½-gross; post free per return.—Burt & Co., 45, Monument Rd., Birmingham.

GOOD Seconds, Bromide and Gaslight Postcards (all surfaces), 250 8s. 6d.; 500 15s., 1,000 27s. 6d.; first quality, ditto satin, 100 5s., 500 22s. 6d., 1,000 42s. 6d. Post free.—Burt & Co., 45, Monument Rd., Birmingham.

HOOD Blocks are Good Blocks!

MOUNTS.—Splendid quality 16-sheet stout white "Challenge," 9 x 6½, cabinet, 15s. 6d.; 10 x 8, ¼-pl., 21s.; 12 x 10, 1/1-pl., 30s.; 18 x 14½, 12 x 10, 66s.; 20 x 15½, 12 x 10, 72s.; 24 x 19, 15 x 12, 105s.; 100 carriage paid.—Crown Manufactory, Rotherham.

MOUNTS.—Improved quality "Glenburn," white, stout boards, 9 x 6½, cabinet, and postcard, 10s. 6d.; 10 x 8, ¼-pl., 14s.; 12 x 10, 1/1-pl., 20s.; 15 x 12, 10 x 8, 37s. 6d.; 18 x 14½, 12 x 10, 50s.; 100 post free; all from stock; immediate despatch.—Crown Manufactory, Rotherham.

NEG Paint, used for blocking out negatives, lantern slides, etc., etc., price 1s., postage 3d.; twice the quantity usually sold for 1s. 6d.; inquiries from dealers invited.—Manufacturer, W. Wild, 16, Smallbrook, Birmingham.

PLATES.—R.A.F. surplus at about half list prices. Condition guaranteed.—Pompey, 8, Arundel St., Portsmouth.

PLATES (reliable), fast and medium speeds, ¼-pl., 2s. 6d. doz., 7s. 3 doz., 24s. gross; ½-pl., 4s. 6d. doz., 13s. 3 doz., 44s. gross. Carefully packed and carriage paid. Satisfaction guaranteed, or money refunded.—Burt & Co., 45, Monument Rd., Birmingham.

THE AERIAL PHOTO CO.

SPECIALISTS IN

POSTCARD PRINTING

STUDIO WORK & SAME DAY SERVICE.

VITĒGAS or BROMIDE, All Surfaces.

BLACK 1/8 Doz. SEPIA 2/- Doz.

VIEW WORK

FROM 16/- PER Gross

QUALITY & PROMPTITUDE GUARANTEED.

ENLARGING, CONTACT PRINTING, RETOUCHING, &c.

PRICE LIST AND SAMPLES FREE.

24, NARROW ST., PETERBOROUGH.

Postcard Printing

Enamelled, Matt or Carbon.

BLACK 1/10 per doz. SEPIA 2/4 per doz.

Special rates for Publishers and large quantities.

Express Service for Topical Work when required.

STUDIOS May rely upon careful personal attention to their orders and first-class work. We can work to your own times.

ENLARGING, COPYING, CONTACT PRINTING.

First quality work at moderate prices.

PRICE LIST and SAMPLES post free.

A. F. LAY, 25, DOWNS RD., CLAPTON, LONDON, E.5

Telephone: DALSTON 698.

P.O.P. Postcards, matt and satin, fresh and full size, 32s. 6d. 100; sample 100, 4s. 6d.—Burt and Co., 45, Monument Rd., Birmingham.

P.O.P. Glossy only, splendid condition, ¼-plate only, 72 pieces 2s. 6d., 144 pieces 4s. 6d. Why pay more?—Charles Hunt, 15, Hillcrest Rd., Acton Hill, W.3.

P.O.P. (fresh from the factory).—Glossy Cabinet, 7s. gross, 4s. ½-gross, ¼-pl. 8s. gross, 4s. 6d. ½-gross; Glossy Postcards, 100 5s., 500 22s. 6d., 1,000 42s. 6d.; post free per return.—Burt & Co., 45, Monument Rd., Birmingham.

POSTCARDS.—Finest standard quality Gaslight and Bromide, 58s. 1,000, post free; samples 6d. Self-Toning, Glossy, 71s.—Crowe Manufactory, Rotherham.

POSTCARDS.—Bromide and gaslight, all grades, 32s. 6d. 1,000; one price, one quality. We have a splendid line in stripe at 37s. 6d. 1,000, glossy and matt only.—Charles Hunt, 15, Hillcrest Rd., Acton Hill, W.3.

POSTCARDS, Bromide and Gaslight (superior quality), glossy, matt, and satin, 100 4s., 500 16s., 1,000 30s., post free. These cards are undoubtedly the finest low-priced card on the market (usual price, 35s.). Hundreds of testimonials.—Burt and Co., 45, Monument Rd., Birmingham.

POSTAL Cases for mounts, proofs, and postcards, ½d. post; Envelopes, Letterpress Printers; samples and prices.—Rookes, 198, Broadway, London, N.W.9.

PRESS Glossy Brom. Paper, 8 x 6, 12s. gross; 1 1-pl. 14s.; grand quality; post free.—Burt and Co., 45, Monument Rd., Birmingham.

STRIPS, 6-on, Bromide Postcards, all surfaces, good seconds, 37s. 6d. 1,000; first quality, 47s. 6d.; post free per return.—Burt & Co., 45, Monument Rd., Birmingham.

SELF-TONING Paper (superior quality), ¼-pl., 5s. gross; 5½ x 4, 7s. 8d.; 6 x 4¼, 8s. gross, 4s. 6d. ½ gross; ¼-pl., 9s. gross, 5s. ½ gross; Postcards, 5s. 6d. 100. Post free per return.—Burt & Co., 45, Monument Rd., Birmingham.

V.B. FIRST quality Job Lines.—Sent return post for registered cash, or professionals call. Large stock Nikto Enamel Bromide Paper; best stout bases, rich emulsion, non-abrasion, sepias splendid, guaranteed perfect, clearing less than half nett prices. 15½ x 11½ 25s., 20½ x 7½ 21s., 11½ x 9½ 17s., 100 sheets postage 1s.; 8½ x 7 10s., 8½ x 6½ 9s., 8 x 6 8s., 100 sheets postage 9d.; ¼-pl. 12s. 6d., 6 x 4½ 10s. 6d., 250 sheets postage 6d. Stripe, 23½ x 8½, 167 sheets 36s. 6d.; 21½ x 5½, 167 sheets, 33s. 6d., postage 1s.; 250, 6½ x 3½, three on, 9s. 6d., postage 6d. Bromide Papers, White Royal, permanent satin and matt, ¼-pl. 13s. 6d., 6 x 4½ 11s. 6d.; permanent satin, cabinet, 9s. 6d.; 5½ x 3½, 5 x 4, 8s. 6d. Velvet and Permanent Satin, 4½ x 3½, 7s.; ¼-pl. 6s.; 250 sheets, postage 6d. White Royal, 9d. Other lines, Platino Matt, 20 x 7½. Permanent larger sizes. Gaslight Carbon Paper. Postcards, Velox Gaslight, Semi-Glossy, and Solio Self-Toning, Matt, P.O.P. Guaranteed perfect. Sample 250, 12s. 6d., postage 6d. Bromide Glossy and Carbon, six on. Prices application. Replies, stamped envelope.—Photographic Supplies, 142, Bridge St., Bow, London, E.3.

WATKINS' Manual, new edition, 1s. 6d post free. Bee, Snapshot (for Kodaks) or Studio Exposure Meters, post free, 5s. 2d.—Watkins' Meter Co., Hereford.

WHEN you want Blocks in colour, line, or tone, get them from Hoods, who are expert Illustration Printers themselves.—Hoods, Engravers, Sunbride Works, Middlesbrough.

20 x 16 Rough Bromide Paper, good quality, 45s. 100 sheets. Larger quantities cheaper.—Burt & Co., 45, Monument Rd., Birmingham.

30s. is now our price for Postcards, both Bromide and Gaslight (previous price 35s.). We can give immediate delivery of any surface, in any quantity. These are our Standard Quality Cards, which have been famous for many years. Hundreds of customers, and every one satisfied. Sample 100, 4s.; 500 16s.; post free per return.—Burt & Co., 45, Monument Rd., Birmingham.

100 LETTER Headings, Cards, Invoices, 2s. 6d post paid.—Edgar, Printer, 26, Shankhill Rd., Belfast.

Service.

Printing, Retouching, Enlarging, etc.

ANY Photo Copied.—6 P.C. 1s. 6d., 12 2s. 6d.; sepia and postage extra.—Imperial Studio, 123, Holloway Rd., London, N.7.

ARTIST, with Aerograph, undertakes Colouring, Finishing small Sketch Work, Enlargements; good work; prompt attention.—Miss Fairbairn, Lound, Lowestoft.

ARTISTICALLY Coloured Miniatures, 7d. each, any photo. copied; postcards, 6 1s. 6d., 12 2s. 6d.; postcards coloured, 4d. each. Send trial order.—Victoria Art, 6, Denly St., Balham, S.W.

ALL kinds of Printing, Developing, Copying. Advertiser can also entertain standing orders. Best materials only; no seconds; send for prices.—Vincent E. Walker, 110, Woodside Rd., Sidcup, Kent.

A.—WATER-COLOUR Portraits; 20 x 16 stretchers, brilliant productions by fully qualified artists, 12s. 6d.; oil-colours, 17s. 6d.—Academy Studios, 44, Berners St., Oxford St., London, W.1.

A.—ACADEMY PANELS; a very attractive line in good taste; picture 10 x 6 on 18 x 12 P.S.M., 3s.; B. & W., 4s.; sepia, 6s.; water-colours.—Academy Studios, 44, Berners St., Oxford St., London, W. 'Phone: Museum 1966.

A.—COMBINATION ENLARGEMENTS and Reproductions from composite negatives, etc., a speciality; postcard printing in all surfaces; B. & W., 1s. 9d.; sepia, 2s. per doz.—Academy Studios, 44, Berners St., Oxford St., London, W.1.

A.—TRADE Printing and Enlarging; expert workmanship; prompt attention; moderate charges.—Academy Studios, 44, Berners St., Oxford St., London, W.1. Price List on application.

ARTOGRAPH CO., Specialists in high-class Contact Printing and Enlarging, Finishing in Sketch or Colour, best work only; prices on application.—10, Grape St., and 212a, Shaftesbury Avenue, W.C.1. 'Phone, Gerrard 7191.

BERNARD L. ASH specialises in high-class Postcard Enlargements from small negatives (glass or film) at 1s. 9d. ½ dozen, 3s. dozen, per subject. Post free. Illingworth's glossy, matt, "Zelvo," or cream smooth cards. Prompt despatch. Not the cheapest, but the best.—38, Studland St., Hammersmith, London, W.6.

CHARLES HEWITT, Enlargement Painter, 15, Winfield Mount, Leeds; Military speciality; likeness perfect.

COPYING.—Best results guaranteed. ¼, 9d.; P.C., 1s.; ½, 1s. 3d.; 1/1, 2s. 6d. Postage extra.—Hargreaves, 39, Abingdon St., Blackpool.

COLLIER'S Glossy Bromide Postcard Printing, 12s. gross, from customers' negatives; satisfaction guaranteed.

COLLIER'S Bromide Enlargements, on best paper, 8½ x 6½, 8d.; 12 x 10, 1s.; 15 x 12, 1s. 6d.

COLLIER'S Sepia Enlargements, on best paper, 8½ x 6½, 1s.; 12 x 10, 1s. 6d.; 15 x 12, 2s.

COLLIER, Photographer, Reading, for good work, good service, and lowest prices.

ENLARGEMENTS.—20 in. x 16 in., nicely finished from any photograph, five shillings post free.—Mansfield, New Brighton, Cheshire.

ENLARGEMENTS.—20 x 16 Trade; prints and finishes; best work; cheapest prices.—Enlargement Studios, 330, Caledonian Rd., N.

ENLARGEMENTS of finest quality on Wellington bromide, all surfaces, 8½ x 6½, 10d.; 10 x 8, 1s.; 12 x 10, 1s. 3d.; 15 x 12, 1s. 8d.; 20 x 16, 2s. 6d.; plus 20 per cent. advance; price list free.—Percy J. Slater, Sawtry, Peterborough.

ENLARGEMENTS.—Oils, Miniatures, Frames, etc. All kinds and sizes. Best work and material at lowest possible prices. Stamp for list. 1s. for frame samples. Trade supplied.—Elite Co. (Dept. J B), 88, Burlington St., Manchester.

ENLARGEMENTS.—Unmounted, 8 x 6 1s., up to 20 x 16 at 3s.; nicely mounted and finished, 8 x 6 2s., 20 x 16 7s. 6d.; printing, p.c., B. and W., sepia, 1s. 6d. doz., any surfaces, retouching included, 1s. 9d.; printing on Kodura & Illingworth's De Luxe, also colouring of highest quality.—Alec Brook, Studio Southborough, Tunbridge Wells.

ENLARGEMENTS of first quality made by experts; 10 x 8 1s. 6d., 12 x 10 1s. 10d., 15 x 12 2s. 6d., 20 x 16 3s. 6d.; dry-mounted on P.S.M., 10 x 8 2s. 6d., 12 x 10 3s. 0d., 15 x 12 4s. 6d.; copying, 1s.; postcard printing black 1s. 10d., sepia 2s. 6d. per doz.; best work only; full price list post free.—A. F. Lay, 25, Downs Rd., Clapton, E.5 Telephone, Dalston 698.

FLASHLIGHT Photographs of dinners, balls, and other functions; also commercial photography of every description for the trade. Skilled operators sent anywhere; moderate trade charges.—Tella Camera Co., 1, Southampton Row, W.C.1. Telephone, Museum 3708.

IVORY Miniature Painter, specialist in highly finished miniatures on ivory, freehand, or with carbon basis; high-class Colourist.—Arthur H. Hunt, "Pendeonis," Devenfans Rd., Dulwich, S.E.21.

MINIATURES sepia coloured, celluloided; films developed and printed; also enlargements from customers' plates or originals; list on application.—Studios, 67, Powerscroft Rd., Clapton, E.5.

POSTCARD Printing from customers' negatives or prints; glossy bromide, 12s. gross.—Blowet, 50, Lordship Lane, Tottenham.

POSTCARD Printing.—B. & W., 1s. 8d.; sepias, 2s. 2d. per dozen; best results guaranteed.—Percy Slater, Sawtry, Peterborough.

POSTCARD Printing.—Not the cheapest, but best possible bromide; glossy or velvet finish; three days' despatch; 1s. 10d. doz.—Tella Camera Co., 1, Southampton Row, London, W.C.

PRINTING, any size.—Postcards, 1s. 8d.; Illingworth's, Paget's; good work.—Brandon, Photographer, 102, Lansdown Rd., Leicester.

RETOUCHING, Blocking Out; best-class work; specimens sent; photographers' own price; prompt return guaranteed.—R. W. Hancock, Photographic Artist, Cove, Hants.

Continued on Supplement 4.

ALL FREE

1: At all times we are willing to send a complete reply, with information and expert advice, relative to any camera or lens purchase, exchange, sale or other transaction required.

Write Now !

2: By return of post, at any time, we will send you full lists of any make of camera, also our own large list of high-class second-hand cameras and lenses, accessories, and all materials, FREE.

Write NOW !

3: For many years we have been large buyers, for cash, of good second-hand cameras and lenses. We are at all times willing to quote a CASH OFFER for any GOOD apparatus you can send us. If our offer is not accepted, we return your apparatus, carriage paid. We have HUNDREDS of grateful letters from customers who praise us for the HIGH PRICES WE PAY.

Write NOW !

4: We allow free examination and trial of any cameras in our stock. Simply deposit with us the list price, and you are allowed three days' free use and examination. If the apparatus does not meet your requirements, return it, and we refund in full. We also negotiate any kind of exchange as part payment, and our exchanges are said to be the fairest in the trade. Is there any camera you desire to test and examine just now?

Write NOW !

5: Send a Postcard to-day for a copy of our Great Bargain List just published. This is what the "B. J." says about our latest Catalogue:—

"Sands, Hunter's catalogue is a piece of trade literature of special importance; in fact, one which no photographer, professional or amateur, can afford to overlook whenever he has a purchase to make."

SEND FOR A COPY TO-DAY.

Write Now!

SANDS, HUNTER & CO., LTD.,
37, BEDFORD STREET, STRAND, W.C.2.

TAKE NOTE TEL. 2865

The Royal Enlarging Co.

TEL. 2865 68, GODWIN ST., BRADFORD. FOR QUALITY

HIGHLY GLOSSED PHOTOGRAPHIC
POST-CARDS.
FROM CUSTOMER'S OWN NEGATIVES,
Per gross 15/- (*assorted*)
ENLARGING, COPYING, RETOUCHING, CONTACT PRINTING AND STUDIO WORK, ETC.
First Grade Cards and Papers used only.
Sample together with quotation on application.
J. & L. KAYE, Photographic Printers, 99, Grove Park Road, CHISWICK, W. 4.

J. BERNARD
for
LOCAL VIEW POSTCARD PRINTING
14 - gr. *views only.* 90/- 1000 *from asstd. negs.*
Titling and Post Free.
3, The Broadway, Friern Barnet Rd., New Southgate, London, N. 11.

A NEW FIRM? NO!
ONE OF THE OLDEST AND BEST
Under Royal Patronage.
TRADE ENLARGERS AND ARTISTS.
Highest Award Grand Prix Paris, 1903.
SEND FOR PRICE LIST.
THE PICTORIAL PRINTING CO.
16, Rockingham Street, LEEDS.

T. S. WHITE,
Photographic and Frame Works, MARKET STREET, HEANOR, NOTTS.
ENLARGEMENTS MOUNTED & SPOTTED. B&W

8½ X 6½ .. 2/-	15 X 12 .. 5/-
10 X 8 .. 2/4	20 X 16 .. 5/- on card
12 X 10 .. 3/6	Copying Free.

FRAMES IN 2-in. SPOON OAK, STAINED & POLISHED.
½-in. SLIP and GLASS.
Rabate Size. Guaranteed Perfect Joints.

12 X 10 .. 4/6	20 X 16 .. 7/-
15 X 12 .. 5/6	24 X 19 .. 8/10
18 X 14 .. 6/-	

Send 6d. for Lists and Samples of Mouldings.
Carriage & Packing Extra. Crate Returnable.

SERVICE (continued).

RETOUCHING and B. and W. and Colour Lessons given by 25 years' experienced London expert, and sole originator of Postal Lessons, all Countries. Chosen re-writer of World's Standard Work, "Johnson's Art of Retouching." Inventor of the finest materials. Non-shifting Retouching Medium, 1s. 9d.; "Negafake" Erasing Pencils (knife substitute), 5s. 10d.; Matt-surface Abrading Powder for negatives, prints, and ivories, 1s. 2d. Slow and defective professionals improved and quickened by entirely original "touch." Novices rapidly taught professional finish. "Negafake," "Stipplette," Faking—wonderful aids imparted.—T. S. Bruce, the only long-experienced original postal teacher, London Expert Tuition Specialist (est. over 25 years), 1, Villas-on-Heath, Vale, Hampstead, London, N.W.3.

RETOUCHING.—Only best work; price list on application.—G. H. Llewellin, 145, Lower Cheltenham Place, Bristol.

RETOUCHING.—Best work; photographers' prices; prompt returns.—Goodliffe, 1, Alexandria Drive, St. Annes-on-Sea.

RETOUCHING.—Finest grain, no coarse stipple; clients' own prices; prompt returns.—Carter, Cottage Studio, Romford, Essex.

RETOUCHING and Colouring by experienced Artist at photographers' own prices.—Brewer, 3, Garden St., Westminster, London.

RETOUCHING.—Many years' first-class experience; fine, careful work; neg. retouched free.—Speight, Dunchurch, near Rugby.

RETOUCHING.—Best-class work; photographers' own prices; prompt return guaranteed.—Taylor and Francis, Great George St., Godalming, Surrey.

RETOUCHING by experienced artists at photographers' own prices; likeness preserved; prompt return.—A. and S. Williams, 30, Pyrmont Rd., Ilford.

RETOUCHING.—Astounding and unique offer; perfect fine modelling; prompt 24 hours' dispatch; P.C., 2s. doz.; mixed, ½-pl., 3s. 6d.; be convinced; specimen neg. retouched gratis.—Mantell, 46, Rutland Rd., Hove, Sussex.

RETOUCHING Lessons, postal or personal.—Every pupil given a first-class, sound, thorough, and practical professional retouching education; no half-methods allowed, and knowledge only of the highest commercial value is imparted; no printed lessons, each is written specially by me according to pupil's progress and abilities; all negatives supplied free; all materials in stock; professionals improved and quickened in their touch; novices taught in the shortest possible time. Are You satisfied with your results? Is there nothing more to be desired? Now the Christmas rush is over you have more time for improvements; let me help you, I can and will; personal attention; ver moderate terms; trade retouching; cabinet heads from 10d., ¾ length 6d. —Apply, White, Teacher of Retouching, Selwood Studio, Frome. Estd. 1907.

STRIP Printing, Developing, Printing, Enlarging; first-class work only; price list on application. —Young, 342, Argyle St., Glasgow.

TAYLOR AND FRANCIS for satisfactory Printing. Postcards, B. & W., 1s. 8d. dozen; despatch 48 hours.—Trade Photo Works, Godalming, Surrey.

WHY Pay More? Contact Printing, Postcards, B. and W., 1s. 6d.; Sepia, 2s. Copying, Developing, Enlarging. Best work only.—Stevens, 55, Comber Grove, London, S.E.5.

1s. 6d. dozen, Postcard Printing (Illingworth's glossy cards).—Sutcliffe, 457, Hawthorne Rd., Bootle.

1s. 6d. dozen, Postcard Printing (Illingworth); prompt delivery.—Humphrey, 26, Maxwell St., Swindon.

1S. 8d. per dozen, Postcard Printing. Guaranteed best results. No cheap cards used.—Slater, Sawtry, Peterborough.

Miscellaneous.

Glass Wanted, Waste Materials, Cinema, etc.

CASH by return.—Wanted, cameras, plates, postcards; anything photographic. — Wilsons, Chemists, Wigan.

CINEMATOGRAPH Mechanism.—Turn your lantern into cinematograph. New £7 15s. Standard size. For home or hall. Sample film and list, 1s. 6d. —"Films," 61, Inchmery Rd., Catford.

GRAMOPHONE Record Exchange will Exchange Records; 5d. each; not less than six; return postage free.—6, Rood Lane, E.C.

NEGATIVES wanted, 12 x 10 and 1/1-pl.; film destroyed; good price paid.—Pompey Works, 8, Arundel St., Portsmouth.

PATENTS, Designs, Trade Marks.—J. Harold Beaumont, Registered Patent Agent, 29, Southampton Buildings, London, W.C.2. 'Phone, Holborn 641.

PHOTOGRAPHS Wanted.—The Publicity Department of Leyland Motors, Ltd., Leyland, Lancs., is glad to consider and pay for, if accepted, photographs showing all kinds of Leyland commercial vehicles in actual service.

SOLDIERS' Graves.—Any Grave photographed in France. State exactly plot, row, number, and cemetery. Six photographs, mounted, 9 x 7, £3; three, unmounted, 7 x 5, 30s. Good agents wanted in England.—Parry (late R.A.F.), 27, Rue Faidherbe, Lille, France.

WANTED, Cameras, Plates, Papers, Postcards, anything photographic; cash by return.—Photo Co., 47, Churchgate, Bolton.

Received Too Late for Classification.

DAY and Electric Lock-up Studio, going cheap; S.E. London, select neighbourhood; no opposition; suit outdoor photographer; price £15.—Box O. 9, 24, Wellington St., W.C.2.

ENLARGEMENTS.—Trade, 20 x 16, special; the right shop for a good print and finish. B. & W. cardboards 3s., sepia 3s. 9d., tinted 4s. 3d.; stretchers, 8d. extra. Water-colour on stretcher, 6s. 6d. Special prices for regular quantities. Terms c.w.o., postage and packing extra.—Harris, Artist, 5, Chapel St., Edgware Rd., N.W.

YOUTH requires position Printer-Enlarger; 4 years' experience; quick and willing; Midlands preferred.—Davis, 42, King's Rd., Evesham.

A Special Line of Unmounted
BROMIDE ENLARGEMENTS
AT
MOUNTING OR TONING EXTRA. 1/6 PER SQUARE FOOT. Any size. SPECIAL TERMS FOR QUANTITIES.
The Cameragraph CO., LTD., 49, Parker Street, Kingsway, W.C.2.
Telephone: Gerrard 4101.

Waste Negatives Bought
Now is the time to sell your Stocks of Old Negative glass. Terms Prompt Cash. We send Boxes and pay Carriage. Films guaranteed Removed.
We take Varnished Negatives also.
HUNT & CO., *Government Contractors,*
4, Elizabeth Place, Rivington Street, Shoreditch, LONDON, E.C. 2.
Phone: 8039 London Wall.

IF
WE CAN SATISFY HUNDREDS OF CUSTOMERS,
WE CAN SATISFY YOU.
We are out for your custom, and will
GIVE YOU PROMPTNESS & QUALITY.
Special Quotations for Weekly Batches.

TRY US AT ONCE.

BROMIDE CO.'S ENLARGEMENTS.

SIZES.	UNMOUNTED, UNFINISHED.		MOUNTED ON NICE STOUT P.S. MOUNTS. FINISHED BY FIRST-CLASS ARTISTS.		
	B. & W.	SEPIA.	B. & W.	SEPIA.	WATER COLOURS.
8½ x 6½	8d.	1/0	1/6	1/10	2/6
10 x 8	10d.	1/2	2/2	2/6	3/0
12 x 10	1/0	1/4	2/9	3/9	4/3
15 x 12	1/3	1/9	3/9	5/0	6/3
20 x 16	1/6	2/0	4/0	5/0	6/0

We Specialise in 20 x 16 Size. Either Stretcher or Cardboard.
FRAMES & MOULDINGS IN GREAT VARIETY.
SEND FOR LISTS.

Bromide Enlarging Co.

Phone: BRIXTON, 2166.
Telegr.: Bromide, Vauxhall.

44 & 46, Wandsworth Rd., LONDON, S.W. 8.

Reflex Work with the Ross Telecentric Lens

Although the Ross Telecentric Lens is useful in almost every branch of photography, it is probably in Reflex Work that its advantages are most apparent.

The Telecentric Lens gives an image twice as large as that given by an ordinary lens from the same viewpoint. It needs no extra camera extension, and it works at an aperture of F5·4 or F6·8.

The Reflex Worker can realize at once what this means. He can get an image twice the normal size without approaching any closer to his subject, an advantage which can scarcely be overestimated in dealing with Natural History Work, Child Portraiture, Sports, Press Work, etc.

This enlargement does not entail any extra fittings to his camera or any reduction in the aperture of the lens. In short, the Ross Telecentric Lens gives you telephoto results with focal-plane exposures.

Send for full particulars.

Ross Ltd., CLAPHAM COMMON LONDON, S.W.

ARTISTIC ENLARGEMENTS

(To the Trade only.)

BLACK & WHITE—SEPIA—or COLOURED

Maximum Quality at Minimum Cost.

Send for Price List to

EXPRESS DEVELOPING CO., (F. WOOD)

(Established 1904.)

Telephone: LONDON WALL 4793.
Telegrams: "EXPREDEVE, EDO, LONDON."

23, OSBORN STREET, LONDON, E.1.

LANTERN SLIDES

by our brilliant process from negs. (all sizes) or prints

WE CATER FOR THE TRADE.

Designers of Advertisement and Cinema Slides.

24-HOUR SERVICE WHEN NECESSARY.

GEORGE PALMER (Universal Cinema Supplies) **Ltd.,**
47, GERRARD STREET, LONDON, W.1.
Write for prices. Regent 1475.

ENLARGEMENTS

J. RUDOCHOFF,

(late Proprietor of the Rembrandt Enlarging Co., of 227, Hampstead Road), begs to inform his numerous clients that he has opened again his Enlarging and Printing Business at

17, BRISTOL ROAD, WESTON-SUPER-MARE,

and guarantees best work in the following:—

8½ × 6½ or	Delivered in 24 hrs. Unmounted. B. & W.	Sepia.	Delivered in 7 days. Mounted and Finished. B. & W.	Sepia	W.C. & Pastels
10 × 8	1/3	1/5	2/9	3/3	5/6
12 × 10	1/9	2/0	4/0	5/0	7/0
15 × 12	2/0	2/6	5/3	6/0	9/0
20 × 16	2/10	3/2	5/9	6/6	10/0
20 × 12	2/6	3/0	5/9	6/6	9/6

Copying 1/-. Packing & carriage extra. Cash with order.

SPECIALITY.

Solid Oil Work.

12 × 10	..	12/6
15 × 12	..	15/0
20 × 16	..	17/6
24 × 20	..	25/0

Best finish, likeness guaranteed. Prices for larger sizes, also without photo basis, on application.

Military Subjects a Speciality.

POSTCARD PRINTING

FROM CUSTOMER'S OWN ORIGINALS.

Collotype (Sepia, Black or Coloured) Photogravure.
Real Photo Editions of Local Views a Speciality.

PROMPT DELIVERY.

Quotations and Samples on application to

HARVEY BARTON & SON, Ltd.,
St. Michael's, BRISTOL.

TO THE TRADE.

Have you tried the

Great Northern Art Co.

10, BENT STREET, CHEETHAM, MANCHESTER,

for your **20 × 16**

ENLARGEMENTS

ALSO

POSTCARD PRINTING

If not, send for Price List.

Oil Paintings, Sepias, Black & Whites.

Quality & Promptness Guaranteed.

P.O.P.

Cheaper from ME

P.O.P., ¼-Plate, 5/- gross; Cabinet, 9/-

GASLIGHT or BROMIDE

PAPER, ¼-Plate, 8/- gross; Whole Plate, 16/-

Gaslight, Bromide, or P.O.P. Cards, 8/- 100.

Write WILLIAM MARTIN, Chemist, Southampton.

MARTIN

GEORGE L. PRICE & COMPANY,

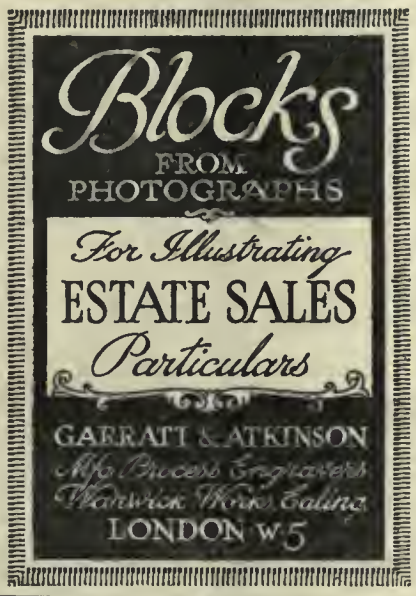
Bagotá, Colombia, South America.

WHOLESALE & RETAIL PHOTO SUPPLIES

Cameras, Lenses, Plates, Films, Papers, Chemicals, Motion-Picture Apparatus, Card-Stock, etc.

BRITISH MANUFACTURERS of photographic apparatus who are desirous of extending their export trade are invited to send catalogues, and price-lists, stating terms and discounts to the export trade. Our sales organisation covers the Republic.

Address: GEORGE L. PRICE & COMPANY,
P.O. Box 1085, Bagotá, or
P.O. Box 88, Barranquilla,
COLOMBIA, SOUTH AMERICA.



POSTCARDS

The World's Best.

STRIPS or SINGLES *Any surface.* **55/-** Per 1,000. Lots of under 5,000 56/- per 1,000 *Carriage paid.*

PHOTO Match-cases. PATENT SLIP-IN PATTERN

Send for Free Samples GLOSSOID CO., 8, Mason's Av., Lond, E.C.2.

ART MOUNTING PAPERS ♣

TEN DISTINCTIVE SHADES.
Sheets 25" × 20"
PER DOZ. **3/9** POST FREE.
Samples Free on Request.

SKETCH BOARDS

ALL WHITE FOR BEVELLING.

6×4 **5/6** per 100; 8×6 **10/-** per 100; 10×8 **16/-** per 100; 25×20 **12/-** per doz.; 32×22 **17/6** per doz.

Samples Free. Carriage Extra.

MARSHALL & CO., Mansfield Road, NOTTINGHAM

¶ Now is the time of year when the Photographer sets about the making of Lantern Slides from the negatives taken during the Summer. It is a pleasing occupation for the enthusiast during the long Winter evenings, but what is more pleasing still is when the opportunity presents itself to project the slides on to the screen for the instruction and amusement of one's friends. For lantern work the book entitled "The Optical Lantern" is what you want. The price is, in paper boards, 1/6 (post 1/10½), or paper covers 1/- (post 1/4½). It is published by the Cursitor Publishing Co., 12, Cursitor St., Lond., E.C.4.

AN AUCTION SALE OF CAMERAS AND LENSES

is held at STEVENS' AUCTION ROOMS every Friday throughout the year. Catalogues and particulars on application. Goods received in early sales. Estd. 1760.

38, KING STREET, COVENT GARDEN, LONDON, W.C. 2.

CELLULOID SURFACED

MINIATURES

from Copies.

We have produced these since 1898.

The most Popular

PEACE LINE.

Send for Price List.

POSTCARD PRINTING

per **1/10** doz.

DORRETT & MARTIN,
16, Belle Vue Rd., London, S.W.17
Tele. No. 1233 Battersea.

MINIATURES.
MINIATURES.
MINIATURES.

Neatly Coloured and Celluloid Faced

9d. each.

C.W.O. Postage extra.

Quick Dispatch.

Satisfaction Guaranteed.

Reduction for Quantities

HILL & KELLOCK, Ltd.,
29, Oxford Street, GLASGOW.

ALFRED PERCIVAL & CO.,

Best Work Guaranteed.

154, FLEET ST., LONDON, E.C.

ENLARGEMENTS.

20 x 16 **DO YOU REQUIRE** 20 x 16

BEAUTIFUL PRINTS, QUICK DESPATCH, LOW PRICES?

IF SO WRITE AT ONCE FOR PRICE LIST, AND YOU WILL SAVE POUNDS.

The BRITISH TRADE ENLARGING Co.
5, Nunn Street, NEWCASTLE-ON-TYNE.

FRAMES

2in. Solid Spoon Oak, Stained, with 1 in. Flat or ¾ gilt slip	48/-	per doz.	20x16
2 in. Rosewood, Walnut, or Green Polished with gilt edge	26/-	per doz.	20x16

20 x 16. 15 ozs. GLASS. 1/6 per Sheet

M. KUTNER, 105, Hackney Road, Shoreditch, LONDON, E.2.

REDUCTION IN PRICES
by the
CITY PICTORIAL WORKS,
3 & 5, The Hayes, Cardiff,

Due to reduced prices of plates, chemicals, etc.
High standard of work fully maintained.

NOTE OUR ENLARGEMENTS.

8 x 6	10 x 8	12 x 10	15 x 12
10d.	**1/-**	**1/3**	**1/9**
18 x 14	20 x 16	24 x 20	30 x 20
2/6	**3/3**	**5/6**	**8/6**

25% extra for Sepias.

The above prices are for unmounted work from customers' own negatives. Price List for Copying, Finishing, etc., on application.

ALL WORK DESPATCHED IN 3 DAYS.

The City Pictorial Works satisfy the claims of a number of important Studios in South Wales, and will be found equally worthy of a trial by photographers elsewhere.

POSTCARD PRINTING

Quick Despatch for Military and all Outdoor Work. Specimens sent. **1/6** per doz. c.w.o. Plates dev. & numb. Enlarg., Copying, &c. Studio work carefully attended to.

First-class WORK and MATERIALS ONLY.

WILD BROS. 163, HARTFIELD ROAD, WIMBLEDON, S.W. 19.

BEST WORK
GOOD FINISH
MODEST PRICES

W. KING & CO.,
Kingston Enlarging Works,
Southsea Road,
KINGSTON-ON-THAMES.

STRAINERS
(COVERED AND UNCOVERED.)
For 20×16 Enlargements, also STRETCHERS COVERED WITH CANVAS FOR OIL PAINTINGS.
For prices write to the Makers—
GRIFFITHS' STEAM WORKS, 26-31 Eyre Street Hill, Hatton Garden, E.C.
Telephone No. 1295 Central.

Oh! That Reminds Me
to Enquire the Price from
M. I. COFFMAN
for his
20 × FRAMES × 16
Photo & Frame Works, Swansea.

Postcard Printing
GLOSSY or MATT **1/6** PER DOZ. BEST MATERIALS USED.
Developing, Retouching, Copying, &c.
PRICE ON APPLICATION.
W. J. WILLMETT, Crescent Photo Works, HASTINGS.

SNAPS that will interest other photographers are being bought by us if taken with a camera of our own make or on "Ensign" Roll Films. Send some prints along. We may buy the negatives.

HOUGHTONS LTD.,
Advertisement Department,
88/89, High Holborn, W.C.1.

Watkins' Bee Meter. 5/-
Also for **INDOOR, STUDIO, &c., DEVELOPMENT TANKS FOR PLATES.**
Send for New "Meters and Methods."
Prices, including Speed-cards and Refills,
ADVANCED NOVEMBER 1st.
Watkin's Meter Co., Hereford.

DO YOU WANT
To TEAR, to PINCH, to SCRATCH?
Do your Hands BURN, SMART, and IRRITATE at night; CRACK, DRY UP, PIMPLES appear; do they nearly SEND YOU MAD?
This is **METOL POISONING** in a bad form.
Why let them get so bad?

UJAH
Will soon remedy all this and make them smooth and soft again.
No case is too BAD, never mind of how long standing. Send for sample, price 9d. The proof is in the results.
2/9 and **4/9** per jar. Postage **3d.**
UJAH OINTMENT CO.,
Clarendon Street, OXFORD.

'Photopake'
Should be in Every Workroom.
It is indispensable for Spotting and Blocking out Negatives and Lantern Slides. All Photographers and Process Workers understand its value.
Wherever there is a Photographer, there you will find "Photopake."
PRICE: 1/3, 2/3, 4/-, 15/6 & 30/- Postage Extra.
Send for New Edit. Now Ready.
The Vanguard "A" Co., Maidenhead, England.

ACADEMY
ENLARGEMENTS.

Size.	Unmounted B.W.	Unmounted Sepia	Mounted and well finished B.W.	Mounted and well finished Sepia	Mounted and well finished Coloured
8½ × 6½	1/-	1/3	2/3	2/11	6/3
12 × 10	1/6	2/-	4/-	5/-	7/-
15 × 12	2/-	2/8	5/-	6/-	8/6
20 × 16	2/6	3/6	6/3	8/6	10/6

ACADEMY PANELS 18 × 12 P. S. M.
B. & W. 3s. SEPIA 4s. COLOURS 6s.
WATER COLOURS 20 × 16 Stretcher 12s. 6d.
OIL COLOURS Do. Do. 17s. 6d.

POSTCARDS
B. & W. **1s. 9d.** SEPIA **2s.** per doz.
CASH WITH ORDER. FULL LIST ON APPLICATION.

Carriage and Packing Conditions.
For orders value over £2 net no charge.
" " " up to £2 " send 1d. to the shilling.
" " " " £1 " " 2d. " "

ACADEMY STUDIOS
44, BERNERS ST., LONDON, W.

ENLARGEMENTS.

Size.	Unmounted B. W.	Unmounted Sepia	Mntd. & well finished B.W.	Mntd. & well finished Sepia	Mntd. & well finished Colour'd
10 × 8	1/6	1/10	4/-	4/6	8/-
12 × 10	1/10	2/3	5/-	5/6	12/6
15 × 12	2/6	3/-	6/6	7/-	15/-

Packing and Postage extra.

POSTCARD PRINTING.
BLACK. **1/10** *SEPIA.* **2/4** PER DOZEN.

E. L. SCRIVENS,
QUEEN'S ROAD, DONCASTER.

ENLARGEMENTS
We guarantee Best Work in the following:—

Unmounted.		Mtd. on P.S., & well Spotted.	
8½ x 6½	1/-	8½ x 6½	2/-
10 x 8	1/3	10 x 8	2/6
12 x 10	1/6	12 x 10	3/3
15 x 12	2/-	15 x 12	4/6
20 x 16	3/-	20 x 16 str.	5/9

Sepia 6d. extra. Copying 9d.
Cash and postage with order.
Also POSTCARD PRINTING, RETOUCHING, etc.
THE EXCELSIOR STUDIOS,
330, High Street, Stratford, London, E.15.

POSTCARD PRINTING
Best quality only. **1/10** per doz., c.w.o.
List and Samples Free. Outdoor Photographers Catered for.
CAMP WORK, SAME DAY SERVICE.
PLATES DEVELOPED, NUMBERED, ETC.
ALFRED PETTITT, The Art Gallery Studios, KESWICK, CUMBERLAND.

FRAMES
2 Inches ROSE & GILT
20 × 42/- Per Doz. × 16
OAK MOULDINGS, 2 to 6 ft. lengths pressed & plain.
Specially low prices. BIRMINGHAM MOULDING WAREHOUSE, 48, Gt Hampton Street, Birmingham.

ENLARGEMENTS.
Finest results guaranteed.
PLATE SUNK MOUNTED AND SPOTTED.
8 x 6 **2/-** 10 x 8 **2/6** 12 x 10 **3/6** 15 x 12 **5/-**
SEPIA 6d. extra. Copying Photographs 1s.
RETOUCHING, PRINTING, ETC.
FAULKNER & BEEBY,
26, Archway Road, LONDON, N. 19.

Compliments of the Season
To the Numerous Customers of
THE SWIFTPRINT Co.,
144, Northcote Rd., Battersea, S.W.11.

POSTCARD PRINTING
BLACK & WHITE. **1/7** doz. SEPIA. **2/-** doz.
SEND FOR LIST AND SAMPLES.

The British Journal of Photography.

Increase in Price to 3d.

IN consequence of successive advances in printing charges and of the continued high cost of paper, in each case amounting to 200 per cent., the price of *The British Journal of Photography* will be increased to threepence.

The advanced price will come into force with the issue of next week, January 2.

Henry Greenwood & Co., Ltd.

"SERCHOL"

The Infallible Picture Builder

A British Production replacing German Metol. SERCHOL is more active, easier to control, keeps better, is stainless, gives richer blacks in prints.

Descriptive Booklet post free.

1oz. 3/9 ¼lb. 15/- 1lb. 60/-

Special Quotations for Overseas Markets.

W. BUTCHER & SONS, LTD.
CAMERA HOUSE, FARRINGDON AVENUE,
LONDON, ENGLAND.

Reginald E. Carter Ltd.

12 Lower Seymour Street, Portman Square, W.1

Built up on sound quality

MAYFAIR
DRY MOUNTING
TISSUE

Reginald E. Carter - - - - - - - - *Managing Director.*

A BECK LENS FOR EVERY PURPOSE

FOR GENERAL LANDSCAPE WORK.

ISOSTIGMAR SERIES II f/5·8.

No.	Focus Complete.	Plates suitable for at full Aperture.	Price in Mt. with Iris Diaphragm.
	in.	in. in.	
1	2¾	2½ × 1½	£4 15 0
3	4¾	4¼ × 3¼	4 15 0
4	6	5 × 4	5 5 0
*4a	6¾	5½ × 3½	5 15 0
5	7¼	6½ × 4¾	6 10 0
6	8¼	7 × 5	9 10 0

*This size has an aperture of only f/6·3.

ISOSTIGMAR SERIES IV f/6·3 ANGLE 90°

No.	Focus.	Suitable for plate when used as wide angle.	Suitable for plate when used as ordin. lens.	Price in mount with Iris Diaphragm.
	in.	in. in.	in. in.	
2	3½	4¼ × 3¼ 5 × 4	3½ × 2½	£6 5 0
3	4¾	6½ × 4¾	4¼ × 3¼	6 10 0
4	6	8½ × 6½	5 × 4	7 0 0
5	7¼	10 × 8	6¼ × 4¾	8 10 0

NEOSTIGMAR.

SERIES IIn f/6.

No.	Focus.	Plate covered at full aperture	Plate covered at moderate stop.	Price.
	in.	in. in.	in. in.	
3	4¾	4¼ × 3¼	5 × 4	£3 10 0
4	6	5 × 4	7 × 5	4 0 0
4a	6¾	5½ × 3½	8 × 5	4 15 0
6	8¼	7 × 5	10 × 8	5 15 0

SERIES IIIn f/7·7.

No.	Focus.	Plate covered at full apertore.	Plate covered at moderate stop.	Price.
	in.	in. in.	in. in.	
3	4¾	4¼ × 3¼	5 × 4	£3 0 0
4	6	5 × 4	6½ × 4¾	3 10 0
4a	6¾	5½ × 3½	7 × 5	3 15 0
6	8¼	6½ × 4¾	9 × 7	4 10 0
8	10½	8½ × 6½	10 × 8	6 5 0

FOR PORTRAITURE & TECHNICAL WORK, PHOTOGRAPHING MACHINERY, BUILDINGS, ALSO COPYING.

ISOSTIGMAR SERIES Ia f/6·5.

No.	Focus.	*Plate suitable for Groups and Landscapes. Full Aperture.	Moderate Stops.	Price in Mount with Iris Diaphragm.
	in.	in. in.	in in.	
7	9½	8½ × 6½	10 × 8	£10 10 0
9	12	10 × 8	12 × 10	19 0 0
11	17	12 × 10	15 × 12	30 0 0
12	19	15 × 12	18 × 16	47 0 0

*For copying, a largea plate can be covered.

FOR PORTRAITURE WITH SOFT FOCUS EFFECTS.

ISOSTIGMAR SERIES VI f/5·6.

No.	Focus.	Size of Portrait.	Size of Group or Landscape.	Price.
	in.		in. in.	
7	9½	C. de V. & Cabinet	8½ × 6½	£14 14 0
9	12	C. de V. & Cabinet	10 × 8	28 0 0
11	17	Panel	12 × 10	44 0 0

FOR FAST SNAPSHOTS WITH REFLEX OR FOCAL PLANE CAMERAS.

NEOSTIGMAR SERIES I f/4·5.

No.	Focus	Plate covered at full Aperture.	In Iris or sunk Mount.	In Focussing Mount.
	in.	in. in.		
3	5	3½ × 2½	£6 10 0	£9 0 0
4	6	4¼ × 3¼	6 15 0	9 5 0
5	7	5½ × 3½	9 10 0	13 0 0
6	8½	6½ × 4¾	12 0 0	15 10 0

R. & J. BECK, LTD., R & J BECK LTD LONDON **68, Cornhill, London, E.C.3.**

Mr. F. J. Mortimer, art editor of the "Amateur Photographer," and of "Photograms of the Year," said that he was Hon. Secretary of the London Salon and a Fellow of the Royal Photographic Society. He explained the difference between ordinary trade photographs and photographs such as would be produced by the appellant, which would be accepted by the Salon and the Royal Photographic Society. The appellant's work showed distinct individuality.

It was contended on behalf of the appellant that the business carried on was a profession—namely, that of an artist in photographic work, and not that of an ordinary photographer, and that the capital employed by the appellant was nominal, and that the profits of his business were dependent on his personal qualifications.

On behalf of the Commissioners, it was contended that the appellant was carrying on a trade or business, and that the exception (c) to Section 39 of the Finance (No. 2) Act, 1915, did not apply.

The Special Commissioners considered the whole of the facts and contentions, and they were of opinion that the appellant came within the charge to excess profits duty and confirmed the assessments.

Mr. Holman Gregory, K.C., Mr. Bremner, and Mr. G. Pilcher appeared for the appellant; and the Solicitor-General (Sir Ernest Pollock, K.C.), Mr. T. H. Parr, and Mr. R. P. Hills for the respondents.

Mr. Justice Rowlatt, in giving judgment, said that the case raised the question whether a man who carried on business as a photographer of a special kind carried on a profession within Sub-section (c) of Section 39 of the Act of 1915. It was a commonplace by this time that the word "profession" in that sub-section could not be exhaustively defined, but, for the purpose of the present case, a man did not exercise a profession unless he exercised an art, the profits of which were dependent mainly on his personal qualifications. It was necessary to inquire whether the decision of the Commissioners was erroneous in point of law. It was true that the appellant's work differed from that of an ordinary photographer. He had gone very much beyond the work of the ordinary trade photographer, but he did not, as it appeared to him (his Lordship), do anything in law beyond what an ordinary photographer did. He had great ability in posing his subjects and in seeing where an attractive picture could be made. He did things in a more elaborate way than an ordinary photographer, but it was all a question of degree. It was impossible to decide that the Commissioners had gone wrong. Where it was a mere question of degree, as in that case, the decision of the Commissioners could not be set aside unless they had applied wrong principles or a wrong test. As it could not be said that they had gone wrong in law the appeal must be dismissed.

THE MICROSCOPE: ITS DESIGN, CONSTRUCTION, AND APPLICATION.

The Faraday Society, the Royal Microscopical Society, the Optical Society, and the Photo-micrographic Society, in co-operation with the Optical Committee of the British Science Guild, meeting in joint session, will hold a symposium and general discussion on "The Microscope: Its Design, Construction, and Applications," on Wednesday, January 14, 1920.

The meeting will be held in the rooms of the Royal Society, Burlington House, Piccadilly, W.1 (by kind permission of the President and Council), and it will extend over two sessions: from 4.30 to 6.30, and from 8 to 10 p.m. During the afternoon preceding the meeting from 2.30 to 4.30, an exhibition will be held in the Library of the Royal Society, which will illustrate recent developments in the science of microscopy and the latest applications of the microscope in all branches of industry.

The purposes of the discussion are:—

(1) To stimulate the study of and research in microscopical science in the United Kingdom by:—

(a) Indicating lines of progress in the mechanical and optical design of the instrument;

(b) Showing, by means of exhibits, recent improvements in the microscope and its technique; and

(c) The varied uses to which the microscope can be applied as an instrument of research in the sciences, arts, and industries.

(2) To encourage the manufacture in this country of the highest class of instrument and of the optical glass required for that purpose.

The meeting will be presided over by Sir Robert Hadfield, Bart., D.Sc., D.Met., F.R.S., President of the Faraday Society, who will deliver an opening address, and Mr. J. E. Barnard, President of the Royal Microscopical Society, will then give a general survey of the subject, and he will be followed by Sir Herbert Jackson, K.B.E., F.R.S. Prof. F. J. Cheshire, C.B.E., will then speak on the Mechanical Design of Microscopes, and a paper by Prof. A. E. Conrady on Microscopical Optics will be presented.

Among those who have, up to the present, also indicated their intention of contributing papers and to the discussion are:—Dr. L. Aitchison and Mr. F. Atkinson, Mr. W. B. Appleton, Prof. Dr. Carl Benedicks and Mr. E. Waldon, Prof. H. Le Chatelier, Prof. C. H. Desch, Dr. J. W. Evans, F.R.S., Dr. F. Giolitti, Dr. W. H. Hatfield, Prof. H. M. Howe, Prof. Zay Jeffries, Mr. W. H. Lamplough, Mr. E. F. Law, Dr. A. McCance, Mr. J. H. G. Monypenny, Prof. Alfred W. Porter, F.R.S., Dr. W. Rosenheim, F.R.S., Dr. G. E. Stead, F.R.S., Mr. H. G. Ryland, Mr. H. M. Sayers, M. E. Schneider, Dr. R. E. Slade and Mr. G. I. Higson, Dr. F. C. Thompson, Prof. W. M. Thornton, Dr. M. W. Travers, F.R.S., Dr. A. E. Tutton, F.R.S., Mr. F. Twyman, Dr. R. M. Walmsley, Dr. W. R. Whitney, and Dr. R. S. Willows.

Exhibits will be shown by Mr. Charles Baker, Mr. Arthur Banfield, Prof. W. M. Bayliss, F.R.S., Messrs. R. and J. Beck, Ltd., Messrs. British Dyestuffs Corporation (Huddersfield), Ltd., the Cambridge Scientific Instrument Co., Ltd., Mr. A. Chaston Chapman, Messrs. Courtaulds, Ltd., Messrs. Dallmeyer, Mr. F. Davidson, Mr. R. Finlayson, Geological Survey and Museum, Col. J. W. Gifford, Mr. R. E. Hanson, Dr. W. H. Hatfield, Mr. Albert Henning, Miss Nina Hosali, Dr. Jaeger's Sanitary Woollen System Co., Ltd., Messrs. Kodak, Ltd., Mr. H. C. Lancaster, Dr. Geoffrey Martin, Dr. J. W. Mellor and Dr. A. Scott, Dr. F. G. Ogilvie, Mr. F. Ian G. Rawlins, Mr. W. C. Reynolds, Mr. J. Rheinberg, Mr. J. Strachan, Dr Marie Stopes, Messrs. James Swift and Son, Ltd., and Messrs. Taylor, Taylor, and Hobson, Ltd.

Further particulars relating to the discussion may be obtained from F. S. Spiers, Secretary, The Faraday Society, 10, Essex Street, London, W.C.2; or C. J. Lock, Secretary, the Royal Microscopical Society, 20, Hanover Square, London, W.1.

THE SCIENTIFIC AND TECHNICAL GROUP OF THE ROYAL PHOTOGRAPHIC SOCIETY.

The first annual general meeting of the newly-formed Scientific and Technical Group was held at 35, Russell Square, on Wednesday, December 17, when about fifty of the members of the Group mustered in the Library, where they discussed tea and cake, and then adjourned to the meeting-room. Mr. W. B. Ferguson, K.C., M.A.(Oxon.), F.I.C., was elected to the chair, and was supported by Messrs. F. F. Renwick, O. Bloch, and Dr. R. E. Slade, who had been acting during the last few months as a provisional and organising committee.

Messrs. Fraser Black and Whitfield Taylor were elected scrutineers of the ballot, and retired with the ballot papers.

Mr. F. F. Renwick, for the provisional committee, said that after the initial meeting steps had been taken to get into touch with all members of the Society, and particularly those who had evinced interest in the proposed work of the Group, about 140 adherents had been secured, and it was hoped that by the New Year the number would reach 200. The subjects in which the members were interested had been tabulated, and a democratic programme drawn up. The council had passed standing orders which gave the Group a constitution, and the provisional committee had drafted by-laws to be discussed and amended, if necessary, that evening, and to be submitted to the council for approval. The initial expenses had been somewhat heavy, but were justified, he thought, by the success achieved.

On the motion of Mr. Slater, seconded by Mr. Sellors, the report was adopted.

The proposed by-laws were discussed *seriatim*, and were adopted with slight alterations. One of these was to the effect that the annual general meeting of the Group should ordinarily be held on the second Wednesday in May instead of on the second Friday in that month. By-law 12 was divided into two parts, and a proviso added to the first that no member might make more than six nominations to the administrative committee. In the second part of the by-law

(now 13) it was provided that nomination papers should be open to inspection by its members. From by-law 20 (formerly 19) the provision for publishing abstracts, etc., in the "Photographic Journal" was deleted. The Chairman volunteered to redraft the by-laws and incorporate the amendments.

The scrutineers, on their return, reported that seventy-four ballot papers had been received (one invalid), and that the following were elected as Administrative Committee:—O. Bloch, F.I.C.; Sir William J. Pope, K.B.E., F.R.S., Hon. F.R.P.S., etc.; F. F. Renwick, F.I.C., F.C.S., A.C.G.I, F.R.P.S.; E. Sanger Shepherd, F.R.P.S.; R. E. Slade, M.C., D.Sc., F.I.C.; G. Whitfield.

The proceedings terminated with a vote of thanks to the chairman.

THE SUCCESS OF BRITISH PLATES IN SWITZERLAND.

With the cessation of hostilities and the subsequent waiving of restrictions in regard to exportations came the opportunity of British photographic firms to make good in the overseas markets. At a first glance this did not seem a very easy matter. In certain countries, such as Switzerland, Germany was in the field, and had been so during the whole period of the war; moreover, freightage was cheaper and the mark was low. But with characteristic British perseverance—a perseverance to which, perhaps, credit is not often given—British firms, quite aware of the magnitude of the task, entered the lists in a whole-hearted manner, and in the first onslaught beat the Teuton. The weapon used was quality. One instance, typical of many, will illustrate this fact. A rotary photogravure firm in Geneva, which had for many years employed German plates, was induced to purchase some newly-arrived British plates—an inducement, by the way, which did not call for an exceptional amount of persuasive powers on the part of the agent. With the first exposure a decided improvement was remarked, the negative possessing a tone and vigour not obtainable in the German plate. Further experiments confirmed the excellent result of the first, and as this particular firm have a reputation for good work, a number of negatives and positives previously made with German plates were immediately scrapped and the originals re-photographed with British plates. The remark of the happy director was brief: "They're dearer, but they're worth it." What more need be said?

A pleasing feature of the presence of the British plate in the Swiss market is the activity displayed by the agents in bringing to the notice of the various firms the excellent quality of the wares they sell. This is having the desired result, and will undoubtedly lead to increased sales.

In Switzerland the amount of three-colour work turned out is not inconsiderable, and there are signs that this is increasing. This fact should attract the attention of dealers in panchromatic plates, and the agents would be well advised to set out on a conquest of those firms using collodion emulsion, for, though emulsion has been in general use for many years and in most cases has successfully resisted the advent of the dry plate, there is no reason why the now perfected panchromatic dry plate should not come into its own, even as the ordinary plate has won laurels in photogravure.

The photo-mechanical plate for half-tone and line work is up against a greater proposition, for here, as is probably the case in England, most firms prefer collodion for this class of work, but for certain subjects it may find a ready sale.

There is still an open road to success for the various makes of bromide paper, and though French and Belgian products are in demand, well advertised British bromide or other papers would certainly be given a trial, and a trial is all that is needed.

E. J. Glumart.

Co-Partnership in the Optical Industry.—An interesting pamphlet has been printed by Messrs. Taylor, Taylor and Hobson, Limited, in the shape of a reprint of an address by Mr. William Taylor setting forth the scheme of co-partnership between the firm and its employees. The scheme replaces one of ordinary profit-sharing, and we are quite sure that firms contemplating plans of this kind will be anxious to study the system which has been evolved, after much study, by Mr. William Taylor.

Assistants' Notes.

Notes by assistants suitable for this column will be considered and paid for on the first of the month following publication.

Dry-mounting Prints of Extra Large Size.

When one is used to a dry-mounting press, it is not pleasant to be suddenly faced with a job for which the process is apparently useless and a reversion to the old wet method seems necessary. This is what happens when the size of a mount is such that it will not go between the arms of the press.

Provided that the unmounted print or enlargement is not too wide, paste and starch can still be avoided by dry-mounting the print to a piece of thin pliable art mounting—such as "Nestor," "Baltic," or "Ensign" art boards—doing any necessary trimming afterwards.

A print so backed can be mounted securely and flat with an edging of Seccotine. To do this well the print should be laid face down on a clean sheet of paper, and the nozzle end of the tube passed lightly around, about 1-16th to ⅛th from the extreme edges. To prevent any possibility of the print bulging in the centre, a couple of lines can be run across in each direction (dividing the back of the print into nine sections). The backed and "seccotined" print is laid on the mount in the required position and put under pressure for an hour or two, when it will be fixed perfectly flat and with no tendency to future cockling.

A good border can be made by cutting the pliable mounting a shade larger than the enlargement, taking care when pressing not to damage the edges on the arms of the dry-mounter.—Thermit.

A Useful Knife.

An excellent scraping knife can be fashioned out of a wooden-handled pushpin and a small piece of hard wood about the size and shape of an average cigar. For very small and fine work this knife will be found exceptionally useful.

The pushpin is chosen for its blued steel point, which should be as long and thick as procurable. This point is extracted with pliers and with the same tool forced point first about half its length into one end of the cigar-shaped piece of wood. The ferrule is next removed from the original handle, taking care not to split it in the process, and the point of the new handle having been shaved down sufficiently, the ferrule is pressed into place over the steel pin.

We now have a blunt pin on a convenient handle. The next step is to grind the pin down to an oblique edge, which can be done with a file, or much more quickly on an emery or carborundum wheel, finishing off on a whetstone.

Such a knife will scrape the most delicate spots from the toughest film without lifting pieces out.—Thermit.

Patent News.

Process patents—applications and specifications—are treated in "Photo-Mechanical Notes."

Applications, December 8 to 13.

Studio Accessories.—No. 30,656. Artificial lighting accessories for photographic studios. J. W. Freckleton.

Cameras.—No. 30,718. Photographic cameras. B. B. A. Johnson.

Colour Photography.—No. 31,091. Apparatus for producing photographs and projecting the same in natural colours. E. C. S. Parker.

Photo-Micrography.—No. 31,025. Photo-micrographic apparatus. S W. Ross.

Cinematography.—No. 30,969. Cinematograph apparatus. T. Baron, A. E. Bettles, R. J. Neil, and F. R. Parnell.

Cinematography.—No. 30,806. Cinematograph apparatus. W. E. L. Day.

Projection Screen.—No. 31,184. Projection screen. Deutsche Lichtbild Ges. and A. Schulze.

Something NEW

Here's a wonderful photographic discovery. It is a printing medium registering the *Vigour* of Gaslight yet possessing the *Speed* of Bromide.

A NEW POWER

It gives a new power to the photographer. Its latitude is enormous, and, with it, enlargements can be made successfully and quickly from the poorest negatives. For topical work it means shorter exposure, for negative difficulties will be overcome by its vigour and its speed

Usual prices. Send immediately for sample to—

CRITERION PLATES PAPERS FILMS LTD.
10, STECHFORD, BIRMINGHAM.

The VIGOUR of Gaslight Paper with the SPEED of Bromide

Criterion Extra Hard Bromide Paper

736A

BLOCK PERFECTION

in all things appertaining to Process Engraving, along with a smart Design Service are yours at

E. Hamel & Co.

NOTTINGHAM.

CINEMATOGRAPHY.—No. 30,856. Cinematograph cameras and projectors. C. Kearton and G. B. Riley.

CINEMATOGRAPHY.—No. 31,159. Cinematograph screens. W. J. Marks.

Trade Names and Marks.

APPLICATIONS FOR REGISTRATION.

OMNIA.—No. 396,323. Cinematographic apparatus. Omnia Kine Apparatus Company, Ltd., 27, High Street, Bloomsbury, London, W.C.2, manufacturers. October 21, 1919.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

MONDAY, DECEMBER 29.

South London Photographic Society. Jumble Sale.
Willesden Photographic Society. "Exposure and Development."
Kidderminster and District Photographic Society. "Amateur Photographer" and "Photography" Prize Slides.

TUESDAY, DECEMBER 30.

Hackney Photographic Society. "Development." W. Selfe.
Bournemouth Camera Club. Whist Drive.

WEDNESDAY, DECEMBER 31.

Croydon Camera Club. The Affiliation 1919 Competition Lantern Slides.

THURSDAY, JANUARY 1.

Hammersmith (Hampshire House) Photographic Society. "One Man Show." L. Miscone.
Richmond Camera Club. "Gaslight and Printing-out Papers." The Paget Prize Plate Co.
Hull Photographic Society. Gramophone Entertainment. F. W. Doughty.
Rodley and District Photographic Society. "Colour Photography." C. B. Howdill.

PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

A MEETING of the Council was held at 35, Russell Square (the house of the Royal Photographic Society), on Friday, December 12, 1919.

Present: A. Basil, Gordon Chase, A. Corbett, C. F. Dickinson, Alfred Ellis, S. H. Fry, Reg. Haines, Geo. Hana, R. N. Speaight, Lang Sims (London members), Marcus Adams (Reading), Frank Brown (Leicester), W. B. Chaplin (Windsor), T. Chidley (Chester), A. H. Chapman (Swansea), and F. Read (Southport). A letter of regret for inability to attend was read from W. Illingworth (Northampton).

The minutes of the last meeting were read, amended, and confirmed. A report from the Congress Committee was presented, containing a skeleton programme based on 1914 experience. The committee proposed to hold an exhibition of professional portrait work, the object of which would be to illustrate the present position of professional portraiture in the United Kingdom. The amount of space at the committee's disposal would not be large, and it was proposed to obtain the exhibits by invitation. The invitations would not be limited to members of the Association. The committee had a considered scheme, and required the approval and authority of the Council to proceed with it. It was moved by Mr. Read, and seconded by Mr. Chase and carried unanimously, that the report be accepted and full power be given to the committee to continue their arrangements and to report to the Council from time to time.

The Finance Committee recommended for payment accounts amounting to £37, and further recommended that, being satisfied that the present position of the Association's finances justified it, the appointment of Mr. Fry as secretary for the year 1920, which appointment was approved in principle at the Council meeting held on October 23, 1919, be proceeded with, and it was moved by Mr. Lang Sims and seconded by Mr. Chapman that the report be adopted; carried unanimously.

Mr. Lang Sims then moved: "That a subscription list be opened for the purpose of presenting a suitable memento to Mr. Alexander Mackie in recognition of his valuable services to the Association extending over a long period." He said that he was sure that every member of the Council had no thoughts other than kind and friendly ones towards Mr. Mackie, whose connection with the Association over a long period of years had been one of whole-hearted enthusiasm for its welfare. His work, both in its earlier and later years, had been characterised by thoroughness and conspicuous ability. The new edition of the P.P.A. Handbook, copies of which had but recently been distributed to the members, was only one item of evidence of his painstaking care. Mr. Mackie had been and was very well known to all, and his work had been of great value to the profession as a whole. He (Mr. Sims) moved this resolution with a great deal of pleasure, as he believed it would meet with the approbation of every member of the Association. Mr. Tom Chidley seconded the resolution. He said he was sure the proposal would meet with everyone's approval and support. Mr. Mackie had given useful and valuable advice to many members of the Association from time to time.

After further kindly references to their former honorary secretary, the resolution was put and carried unanimously. The details of the proposal were left for settlement to the next Council meeting.

The hon. secretary reported that the new edition of the Handbook had been posted to members, and he hoped that it would meet with general approval. There was more useful matter in it than before.

His next effort to overcome the arrears left by the war should be to publish a similar brochure containing the names and addresses of the members. This involved a large amount of personal work, and had been and even now was delayed by the continuous returning of members whose subscriptions had been suspended during their war service. A list of members was of little value unless sufficiently accurate, and however carefully done soon became out of date, owing to the natural loss of members which occurred in a large association, and the constant removals and changes of address.

A considerable number—nearly forty—of new members had come in as a result of the publication of an interview with one of the Association's officials in the Kodak house journal, "The Professional Photographer," and with new members from other sources there was now a list of fifty names which had not yet been read to the Council. He was afraid that the total for the current year would not approach last year's total, however. He had to report that the profiteering case brought by a member had broken down owing to the fact that as photographic postcards were not "scheduled" under the Act, the complaint could not be proceeded with as against the manufacturers.

The November number of the Circular had been published strictly to time, and he had received many letters of approval from members.

There had been a considerable correspondence during the month with members, and many complaints and enquiries had been dealt with. Fire insurance enquiries and proposals had increased owing to publicity in the Circular, and he hoped at an early moment to be in a position to offer the Association's special premium concessions to cover motor-cycles and motor-cars. Amongst the month's correspondence were such varied subjects as copyrights and increased fees; the high prices of photographic materials; the bad rail services, especially delays in the matter of empty returns; the non-supply of roll films to professional photographers; an assistants' union; and prices for difficult ortho-chromatic reproduction work.

This being the last Council meeting in the financial year, the hon. treasurer reported that he expected to be able to present a favourable statement of accounts for the year 1919. The expenses of the Association in conducting its business had been greater in the current year, but the income had also expanded in a manner which he believed the Council and the members of the Association would consider satisfactory.

CROYDON CAMERA CLUB.

DESPITE the genial prophecy that December 17 was to wind up the club, and incidentally the world in general, Mr. W. Kenrick, taking all risks, gave a capital lantern-lecture, entitled "The Work and Records of the Photographic Survey and Record of Surrey." At first sight this subject may seem a dry one except to those interested in the work, but he contrived to make it most interesting to all. He showed convincingly how infinitely superior the eye of the camera is to the perception of the artist when it comes to faithful records—not that the former need be necessarily unpictorial—and it is worthy of note that the finest slide, both in technical quality

and artistic representation, was from a film made with a ten-shilling "Brownie." Mr. Kenrick's own contribution to posterity consists of 2,000 prints and 900 lantern slides, truly a record to be proud of. Here indeed is photography with a purpose.

During the evening Dr. C. Atkin Swan, F.R.P.S., was elected a member of the club with much acclamation. The "office boy" (proposer) said he recently had had the pleasure of witnessing a private rehearsal of a lantern show with the doctor operating the alternating arc, and a most wonderful imitation of a cinematograph seriously out of order was afforded. If only they could persuade the doctor on some future occasion to operate the club lantern for a peppery lecturer, everybody should experience the time of their lives.

The previous week, Mr. Vivian Jobling, with hair cut regardless of expense and looking very trim and spruce, gave an excellent and very practical demonstration on "Staining and Finishing Picture Frames." As a jobling workman he is hard to beat. He advocated narrow oak frames stained to harmonise with the picture or photograph, as the case might be, or else plain walnut, wax-finished. An extra-special and really ingenious mitre-block was brought forward. In his hands it worked like a charm, and enables the two mouldings forming one mitre to be cut with one sawing, which dispenses with planing true and permits of a better grip for the glue. The mitre-block received unanimous commendation, which is unusual in the club, and even the secretary, Mr. Sellors, failed to suggest any improvement, which is more than unusual. The demonstrator strongly recommended all joins should be screwed as well as glued, for then the frames never showed signs of coming apart, even if continuously exposed to damp.

Many recipes for staining followed. For oak frames he recommended, when a good brown colour is desired—black japan, one part; turpentine, two parts. Paint on, leave for about ten minutes, and wipe off all unabsorbed stain. For a very dark brown—burnt umber, oil-colour, is rubbed into the wood; cheap "students'" tubes answer well. For a green—prussian-blue and burnt-sienna water-colours are mixed and well rubbed in. For a "brindle-brown"—soot and water are incorporated and applied with an old brush, surplus being removed with a wet rag.

For finishing, in preference to plain beeswax and turpentine, he advised—beeswax, 3 ozs.; spermaceti, 2 ozs.; turpentine, 10 ozs. Mr. Rose here differed, stating "oiling up" gave a more chaste effect, but Mr. Jobling stuck firmly to the wax.

Correspondence.

**** Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

**** We do not undertake responsibility for the opinions expressed by our correspondents.*

OBJECTIONABLE PHOTOGRAPHS.

To the Editors.

Gentlemen,—All photographers who wish to maintain a clean reputation for their profession should thank you for the strictures contained in "Some Matters of Etiquette" which appeared in your issue of 12th inst.

A certain section of the illustrated Press has for some years pandered to the pornographic portion of the public by publishing prints of the "legs and lingerie" order, with the result that questionable pictures are now accepted quite as a matter of course. People being presumably satiated with the contemplation of calves—shapely and otherwise—the ladies have been induced to undress their upper portions, so that it is possible to acquire an almost complete knowledge of female anatomy by the judicious combination of these two periods of art.

The fact that such things are thrust upon us is, however, no reason why photographers should break away from their legitimate work, and endeavour to secure a doubtful type of *clientèle* by the exhibition of such meretricious productions.

I know of a photographer's window wherein repose a row of "Art studies" (vide label) which fairly shriek "chorus girl with her clothes off"; and, indeed, judicious inquiry discovered this to be the case. The damsels in question are neither pretty nor graceful, and not even the "glad eye" with which they coyly contemplate the observer can compensate for the vulgarity of their ill-formed naked backs and angular arms.

These photographs are exhibited in a busy thoroughfare, yet few women stop to look at them. The moral is obvious, though the photographer is doubtless doing a good, if ephemeral, business in his special line.—Yours faithfully,

OLD HAND.

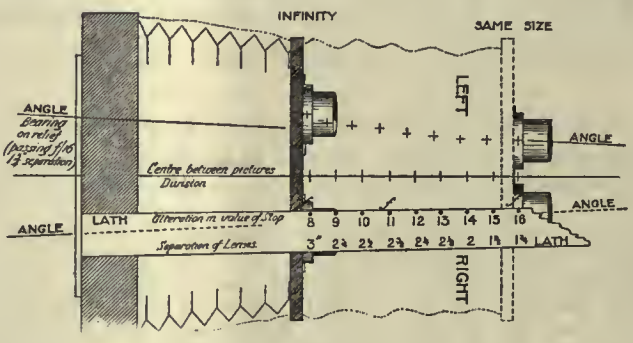
LENS-SEPARATION IN STEREOSCOPIC PHOTOGRAPHY OF SMALL OBJECTS ON THE SAME OR AN ENLARGED SCALE.

To the Editors.

Gentlemen,—May I offer a few remarks on this interesting subject? I have made a few experiments on paper which seem to offer a basis to work on, for near subjects.

On separation of lenses in stereo camera:—

1. When photographing *full size* the distance between focussing screen and the object is equal to four times the focal length of lens.
2. The lens will be about midway at twice its focal length.
3. The separation (laying midway) will be about 1½ ins. (say 1¾ ins.) whatever the focal length may be.
4. When photographing a landscape the lens would be brought back a distance equal to its focal length (viz., infinity), the separation being anything from 2¼ ins. to 3 ins.
5. If we so adjust this difference of focus between a landscape



and an exact size object so that the separation fits it correctly at all places we shall have a ready means of comparing angles and focusses.

6. A 3-in. lens would bring an object full size at 12 ins. from focussing screen (forming an angle at 12 ins. therefrom).
7. A 6-in. lens would extend the object to a distance of 24 ins., forming an angle proportionately.
8. It would appear that for near work the short-focus lenses give the greatest *angular* relief, and the longer focus less angular relief.

On relief in stereo camera:—

1. It would appear that for objects having few planes, such as a coin relief, the shorter focus might give a better rendering.
2. An object with many planes, such as a pin cushion with pins at many distances, would be rendered better by longer focussed lenses.

I am enclosing a drawing to make it as clear as I can, with a suggestion of making a scale on a lath for each focus of lens in use. This would provide a fairly ready means of finding out or comparing the angle, extension, etc., according to scale of object and getting a particular angle of relief by choosing a certain focus lens.

I am, however, enlarging on this subject in a further letter. This covers the subject in the stereo camera, but thoughts go beyond it. —Yours sincerely, JOHN WIELD.

Woodhall Spa.

To the Editors.

Gentlemen,—Mr. Benham's diagram clearly shows the principle involved in taking stereos. at close quarters, if the normal stereo-

Gevaert
PERFECT PICTURES

Ge ert

Call it *Gay'vert*

GEVAERT
VIGOROUS
BROMIDE
in

Glossy, Matt and Semi, and in Postcards, singles, and strips "6-on."

The Ideal of the Press Photographer or for use when additional brilliance or contrast is required.

A paper with very great latitude in exposure.

Full stocks on hand.

Liberal samples of Gevaert Vigorous Bromide upon receipt of trade card.

GEVAERT LTD.
115 WALMER ROAD
N. KENSINGTON, W.10

The British Journal Almanac, 1920.

Edited by GEORGE E. BROWN, F.I.C.

Now in the binders' hands for publication at the end of January or early in February.

The editorial article is titled "Beginners' Failures in Photography," and covers the whole field of photography. It is written in a way to bring it within the understanding of the least experienced.

The fifty-ninth issue of the Almanac, which is restored to its pre-war edition of 25,000 copies, will be found as valuable as ever in the work-room of the amateur and the office of the professional.

The prices remain at 1s. 6d. in paper covers: 2s. 6d. cloth bound. To make certain of a copy, an order should be placed at once with a photographic dealer, bookseller, book-stall, or newsagent.

scopic effect is aimed at; but there are two other considerations: firstly, that if simultaneous exposure is necessary, then the reduced lens separation as shown by this diagram may yet be too great to bring both images on to the one plate; and, secondly, that for scientific purposes it is sometimes useful to get an exaggerated stereoscopic effect by increasing the lens separation. If simultaneous exposure is not essential, is there any objection to swinging the camera direct on to the object for successive exposures of right and left halves?

It will be noted that Mr. Benham takes 2¾ in. as his basis, whilst your original correspondent takes 3 in. as the normal lens separation. I am of opinion that such wide separation is a mistake, and is the result partly of the desire for exaggerated relief, partly of the adoption of unsuitable plate sizes and the fixing of lens separation according to these plate sizes rather than on any logical basis.

My earliest stereo. work was done on a 7 by 5 with lenses of 6-in. focus at 3½-in. separation, but now, for a long time, I have worked with 2½-in. separation (the separation of my own eyes) and lenses of 3½-in. focus, latterly on the 5½-in. by 3½-in. plate. I have never had to reduce this separation for portraits even at 2 ft. away, but for small objects at very close quarters, say 10½ in. from lens, the exaggeration of relief is discernible in the slide. On Mr. Benham's basis of 2¾ in. the separation at 10½ in. should be 2 13-32 in., and on my 2½-in. basis should be reduced to 2 3-16 in.

The exaggerated relief resulting from too great a lens separation is always accompanied by a corresponding diminution of the apparent size of the object. This I think is entirely a mental effect. I have an old slide somewhere of the Matterhorn from Zermatt, some seven miles distant, in which the camera has evidently been shifted bodily, I should guess some two or three hundred yards, for the exposures of the two halves. (The nearest foreground object, by the way, is about 300 yds. away.) The effect in the stereoscope is that of looking at a small model on the table under one's nose.

I do not know what limits there are to a trained sight's stereoscopic vision, but I should think it would require a trained vision to decide which was the further away of two vertical rods, one say 1 yd. high at 100 yds. and one 1 1-100 yd. high at 101 yds., viewed from the base level.

It is a long stretch back to my Jules Verne days, but I remember that Capt. Nemo, of the "Nautilus," was described as having eyes very widely set, and, in consequence, powers of stereoscopic vision approached by no other member of the crew of that early submarine.

The few friends I have measured vary no more than 1-16 in. one way or the other from the 2½-in. eye separation. It would be interesting to know what the average adult separation is, also the extreme variations met with.—Yours truly,

R. W. Blakeley.

4, Seedley Park Road, near Manchester.

MOUNTING BLOCKS TO POINT MEASURES.

To the Editors.

Gentlemen,—It is unnecessary to notice the first five paragraphs of Th. Eamer's comments of December 5. If he has tried to improve conditions in block mounting he deserves thanks, but to claim for the trade generally that conditions as at present are all that can be desired is claiming too much. It is good news to learn that there is no obstacle in the way to successful mounting to points. But "compressed sawdust" and similar subterfuges which chip away readily are worse than anything.

As there is no method of locking up a forme of type to beat side-sticks and quoins made of wood—Hempel quoins being the nearest in efficiency—so no substitute, so far, equals wood for mounting plates, except when mounted on metal. Where firms cast their own types, stereo and electro plates are often mounted on quotations or quads after the type is imposed in the chase. Parker's patent mounts and patent register-finding are too costly for the smaller single blocks.

This week (not ten years ago) I was given a block to include with some letterpress in a job. The block was new, and when placed in a panel showed that it was mounted crooked, and the mount was wider in one part than another. To remedy this the comp. lifted the plate, running the risk of breakage and battering the design when nailing down again. As a price was given for the job this extra time was all loss. This careless mounting is typical of the average block-maker to-day, including houses who cater for stock electro'd designs.

Every employer in the printing trade is not a practical man, and first cost in buying plant weighs with him—he cannot, and will not, see the comp.'s view, especially where quads and furniture are wanted: even practical men look askance. One such employer inferred that the point system was a "red herring drawn across the path" of the printer to create more trade for the typefounder. "Luckily" for him his office afterwards was burnt out—to-day his office is strictly on point body.

The printer in search for ideal conditions finds many pitfalls. About 1884, when the point system began to be talked about, a ring foundry offered to cast types on point bodies—but left it to the confiding printer to find out that the system was based upon their own pica, which was larger than the American. In 1900 another ring founder issued a booklet praising the advantages of the old body types over the new innovation. To-day they cast their types on American point body.

After standing out as long as possible, all ring founders now not only cast on point body but on point line and point set. All types, unless otherwise ordered, are supplied on point body, and 10 per cent. extra is charged when old bodies are ordered. In face of these terms, however, some time ago a ring firm supplied a fount of minion Roman types instead of 7-point body, and the error was only discovered by the printer after ordering "sorts" later on. This same firm also supplied a fount of brass type stated to be 18-point, which was not only untrue to each other in body, but *varied in height to paper.*

By the aid of cast-iron furniture, brass spacing material, and Hempel quoins an attempt has been made to introduce point system in gold-blocking for the binder. Many jobs can now be done from type which other binders find necessary to cast a stereo or electro—binder's height—to execute.

Such are a few of the pitfalls the poor printer finds himself subject to. No wonder he looks shy at innovations.—Yours truly,

J. Hurst.

Shaw Heath, Stockport, December 18, 1919.

Minimum Fleet Street Pay for Photographers.—After much correspondence, several meetings, and the most delicate negotiations, an agreement between the N.P.A. (Newspaper Proprietors' Association) and the N.U.J. (National Union of Journalists) has been arrived at. Although at the moment of writing the agreement has not been signed by both parties, it is expected that the document will have been signed and sealed by the time these lines appear. It relates to all London morning, evening, and Sunday newspapers published by firms who are members of the N.P.A. The agreement is printed in full in the current issue of the Union's organ, "The Journalist," but it is only the clause (No. 12) which deals with photographers that will interest our readers. The minimum weekly rates of payment to be observed by all newspaper proprietors in respect to photographer pressmen and printers from the age of twenty-one, according to the years of service (not necessarily in the same office) are as follow:—Photographer pressmen:—

First and second year (improvers)	£4 4 0
Third and fourth year	5 5 0
Fifth year	6 6 0
Sixth and seventh year	7 7 0
After seventh year	8 8 0

Cases of men who are unfit either through age or incapacity are to be dealt with by a small joint committee. The minimum weekly rates for printers are given as follow:—

First two years as printers	£3 3 0
Third and fourth years	4 4 0
After fourth year	5 5 0

Head printers (of photographs) are to be paid by mutual arrangement from the time of appointment to that position, but in no case less than £5 5s. Another clause (No. 9) deals with hours of work and holidays, which need not be detailed here. Suffice it to say the clause is a particularly good one, and newspaper workers will have no cause to grumble about long working hours and short holidays.

Answers to Correspondents.

SPECIAL NOTICE.

In accordance with our present practice a smaller space will be allotted to replies to correspondents.

We will answer by post if stamped and addressed envelope is enclosed for reply: 5-cent International Coupon, from readers abroad.

Queries to be answered in the Friday's "Journal" must reach us not later than Tuesday (posted Monday), and should be addressed to the Editors.

W. C.—Apparatus for making the living portrait cards is supplied by Move-O-Graphs, Ltd., 60, Doughty Street, London, W.1.

E. K. P. (Vernon, B.C.).—The makers of the Sanderson camera are Messrs. Houghtons, Ltd., 88-89, High Holborn, London, W.C.1.

H. C. E.—If you have natural aptitude, yes. A good teacher of many years experience is Mr. T. S. Bruce, 4, Villas-on-Heath, Vale, Hampstead, N.W.

C. C. W.—The following are the journals dealing with cinematography:—"Kinematograph and Lantern Weekly," 85-93, Long Acre, London, W.C.2; "Bioscope Operator," 85, Shaftesbury Avenue, W.C.2; "Cinema News," 30, Gerrard Street, W.

K. W.—We do not know of such a lens. The effect you describe is usually obtained by tilting the copy considerably and using an ordinary lens greatly stopped down for the sake of depth. In this way you can distort a flat original in one or other of its two dimensions.

M. B.—There are no special materials for while-you-wait photography, the method of which consists in developing and fixing quickly and printing or enlarging from the wet negative. About the best firms for apparatus for this branch of work are Messrs. Fallowfield, 146, Charing Cross Road, London, W.C.2, or Messrs. Billcliff's Camera Works, Richmond Street, Boundary Lane, Manchester.

L. B.—Registration of trade names is now done at the Patent Office, 25, Southampton Buildings, Chancery Lane, W.C., where you could obtain a circular of instructions for the registration of a trade name. If you mean printers' type, you can buy from such printing supply houses as Messrs. Winston, Shoe Lane, London, E.C. If you mean rubber type, it is supplied by Messrs. E. Richford, 8-9, Snow Hill, London, E.C.1.

T. and C.—We do not think that too strong a contrast of light and shade will be found if a diffuser be fixed in the front of each lamp, and proper reflectors be used to illuminate the shadow side. When working close to the light a thin gauze head-screen is very useful to further soften the light. Ten 500 c.p. lamps would give the same illumination as five 1,000 c.p. ones, but would cost more for fitting, without, so far as we know, giving any advantage.

E. G. P.—7½ ins. is much too short a focal length for use with a half-plate condenser. 9 ins. is the shortest focus which should be used, and it is all the better if the focal length is 10 ins. or 12 ins. As regards aperture, this should not be less than $f/8$, and, better, of $f/6$ or $f/4$. With an arc source of light you can get on all right with the smaller apertures, but using a larger light-source and small aperture is liable to give rise to uneven markings on the enlarging easel.

F. F.—Generally speaking, the focal length for pleasant "drawing" of half-plate portraits should be about 10 ins., but this makes a very big lens for an outdoor half-plate camera, and our advice to you is that you should content yourself with a smaller aperture rather than with a shorter focal length. We think $f/6$ ought to be quite fast enough for out-of-door work in the way of portraits, even in dull weather: it is certainly as rapid as is useful in a lens of this focal length for ordinary subjects.

A. M.—We are afraid it is difficult to say anything more definite as to the means of avoiding these markings than was said by Mr. Barnes in the article of June 6. Apparently some papers are more liable to give them than others; and a further point is that they are sometimes avoided by bringing the prints into firm contact with the glass plate whilst both are under water or immersed in the glazing solution. Perhaps one or both of these suggestions may help you to prevent the defect. We wish we could say more, but unfortunately the exact cause of the markings is very imperfectly understood.

J. W.—A negative image on a dry-plate can be converted into a positive by chemical baths, but with almost every plate it is a very uncertain business owing to the thickness of the emulsion film. We gave a résumé of the working methods in an article in the "B.J." of April 18 of this year, to which we must refer you. If you can do with very slow plates, about lantern-plate speed, you can easily effect reversal by almost any of the processes mentioned in the article by using a special slow process plate of the Wratten Division of the Kodak Company, which has a very thin film something like that of the Autochrome plate.

J. H.—1. Unless both negative and print are thoroughly dry there is a danger of the paper sticking to the negative, and also causing brownish patches of stain on the negative. 2. We have never tried it, but we do not think it would work. We suggest the only thing to do would be to intensify with chromium and then see what you can do in the way of removing all the intensification with Farmer's reducer, or, better, iodine cyanide. 3. No; the best thing is to keep to a developer of fixed composition and let under and over-exposures take their chance. 4. Many of the usual supply houses; for example, Griffin's, Kemble Street, Kingsway, London, W.C.2. It is a fairly cheap material.

W. T. S.—Your difficulties are characteristic of the medium. Colours on the best of water-colour paper always dry lighter; the same happens with matt photographic paper. Therefore the artist must build up or allow for the change in single washes. With velvet (gelatine) surface it is usual to rub over with artists' prepared ox-gall to assist the easy flow of water-colours. If a gelatine-collodion velvet paper, it is best to abrade the surface with pumice powder to obtain a "tooth." Any patchiness of working can be hidden by a rub over with wax in turpentine, or two coats evenly applied of methylated finish. The article, "Preparation of Prints for Colouring," which appeared in the "B.J." of August 9 last, will, we think, answer your purpose.

The British Journal of Photography.

Line Advertisements.

Charges for Insertion.

Since advertisements cannot be inserted until fully and correctly prepaid, senders of line announcements are asked to bear in mind the scale of charges. They will thus save themselves delay in the publication of their announcements. A Schedule by which an advertisement can be correctly priced will be sent on request.

Net Prepaid Line Advertisements.

12 words or less	1/-
Extra words	1d. per word.

(No reduction for a series.)

Special Note. Box Number Advertisements.

"Box No." and office address ... ... charged as 6 words.

For forwarding replies add ... 6d. per insertion for each adv't.

If replies are called for this latter charge is not made.

Advertisements cannot be inserted until fully and correctly prepaid.

Orders to repeat an advertisement must be accompanied by the advertisement as previously printed.

Advertisements are not accepted over the telephone or by telegram.

The latest time for receiving small line advertisements is 12 o'clock (noon) on Wednesdays for the current week's issue.

Displayed Adv'ts should reach the Publishers on Monday morning.

The insertion of an Advertisement in any definite issue cannot be guaranteed.

HENRY GREENWOOD & CO., Ltd., Publishers, 24, Wellington Street, Strand, LONDON, W.C. 2.

Paget

Professional Plates.

Two Unrivalled Brands for Studio Work.

PROFESSIONAL EXTRA RAPID (400-450 H. & D.)

Exceptional speed, beautiful gradations, extreme freedom from fog, great uniformity.

PROFESSIONAL MEDIUM (200-250 H. & D.)

The same qualities as the extra rapid brand, but about half the speed.

No Studio is complete without one of these Brands. A trial will be found well worth while.

For those who prefer BACKED plates the Paget "INVISIBLE" backing should be used. This backing is an efficient preventive of halation, and is completely bleached in the developer. Absolutely no trouble or mess.

Manufactured by

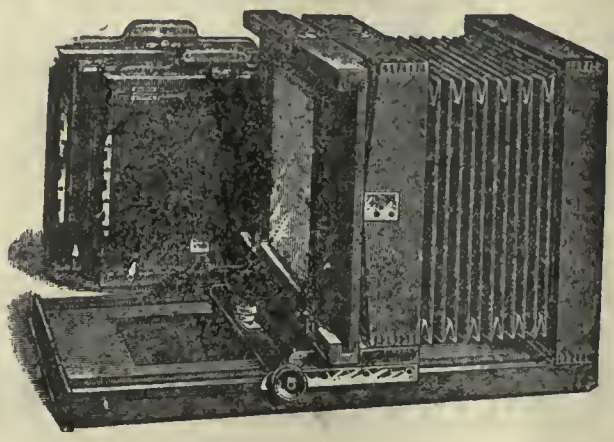
The Paget Prize Plate Co., Ltd.,

WATFORD.

The Salex Studio Camera.

A triumph of modern design and workmanship.

The Salex Studio Camera meets all the requirements of the modern professional photographer. It embodies all the movements and adjustments necessary to successful professional portraiture and yet has no unnecessary complications. It is made throughout in London and is constructed of selected mahogany attractively finished in the new dull satin polish. Every adjustment is made quickly and conveniently—Focusing Pinions are fitted at the back of the camera on both sides—Ample Rising Front and Vertical and Horizontal Swing with convenient clamping arrangements are also provided. Each camera is supplied with two single repeating slides and a complement of masks and carriers. The Salex Studio Camera is the acme of convenience and efficiency and is an ornament to any studio.



Post Card Camera, supplied with two slides, each taking three P.C. size plates side by side. ½-pl. Camera, supplied with two slides, one taking two P.C. plates side by side and for two panels on a post card, the other is fitted with carriers, P.C., 5 x 4 and ¼-pl. and for three panels on a post card.

Post Card Camera is made for use with ½-pl. slides as ½-pl. camera, also

1/1-pl. Camera, supplied with two slides, one for two ½-plates side by side, and carriers for all usual sizes are included.

Size.	Extension.	Price with 2 Slides. £ s. d.	Extra Slides. £ s. d.
Post Card	30 in.	12 0 0	1 17 6
½ pl.	30 in.	12 0 0	1 11 6
1/1 pl.	36 in.	15 0 0	1 17 6

The Salex Enlarger. A convenient and complete enlarging apparatus of the same fine workmanship as the Salex Camera. Rack and Pinion Focussing. Rising and Falling, Revolving and Swing adjustments, with condenser and high quality objective ½-plate, **£20 2 6.** 1/1-pl., **£35.** The best value on the market.

Call and see the Salex Camera and Enlarger. We will take your own apparatus in part exchange if desired.

THE CITY SALE AND EXCHANGE,

90-94, FLEET STREET, E.C.4.

TELEPHONE: CITY 6981. TELEGRAMS: "FILMS, FLEET, LONDON."

HIGH GRADE ENLARGEMENTS ARTISTIC FINISHING *on Best Quality Paper.*

18 x 14
Bromide Enlargement
Artistically finished in
Water Colours.
7/6

20x16	Bro. Enl. do.	**9/6**
24x20	do. do.	**14/-**

Specify your wants.

12 x 10
Bromide Enlargement
Mounted P.S.M. and
Skilfully finished in
Black & White.
4/6

15x12	Bro. Enl. do.	**6/6**
18x14	Plain Mount	**6/6**
20x16	do.	**7/6**
24x20	do.	**10/-**

SEPIA.
12 x 10
P.S.M. & finished
by Competent Artist.
5/6

15x12	P.S.M. do.	**7/-**
18x14	Plain Mount do.	**7/6**
20x16	do. do.	**9/-**
24x20	do. do.	**12/-**

MINIATURES
POST CARDS
ENLARGEMENTS
FINISHING in
MONOCHROME
WATER COLOUR
OIL COLOUR.

Quick Despatch. *Satisfaction Guaranteed.*

HILL & KELLOCK, LTD.,
29, Oxford Street, GLASGOW.

UNIQUE OFFER.

Surplus Stock of

Bromide Postcards

(IMMEDIATE DELIVERY)

GLOSSY and MATT,

in Strips of Six—21½ × 5½, and Singles.

THESE CARDS MADE BY A BRITISH FIRM AND REPRESENT UTMOST VALUE.

Minimum Quantity Supplied per Grade

167 Strips (1,000 Cards) or 1,000 Singles } at 32/-

Carriage Paid—Cash with Order.
No reduction in price possible for any quantity.

OFFER CANNOT BE REPEATED.

Send your order, with remittance, to

Boots The Chemists

Wholesale Photographic Dept., 57, FARRINGDON ROAD, LONDON, . . E.C.1.

N.B.—These cards cannot be obtained through any of our Retail Branches.

Is Your Studio Complete?

We specialise in bargains for professional photographers.

Your studio is never complete. There is always some little, or perhaps some big thing lacking something that will help you to do better work and thus increase your business. It may be a new lens, a new camera, or some dark-room accessory like an enlarger. You can probably think of something now that you would like to have in your studio. Why not have it? Is it a question of cost? In all probability we have that very article in stock at a price to suit your pocket, and remember everything we sell is guaranteed to be in sound working order. Let us send you our second-hand list; it contains hundreds of bargains for the progressive professional photographer.

FOCAL-PLANE CAMERAS.

¼-pl. Nettel Deckrollo Focal-plane, 8½-in. Zeiss Tessar F. 4.5 anastigmat lens, self-capping focal-plane shutter, speeded from 1/10th to 1/2,000th part of sec. and time, focussing adjustment, 4 double dark slides, solid leather case, unsoiled; £32 10s.

½-pl. Professional Model Goerz Anschutz. Goerz Dagor Series III. F. 6.8 double anastigmat lens, focussing mount, focal-plane shutter, speeded from 6 to 1/1,000th sec., direct vision finder, 3 double dark slides, and leather case; £19 15s.

Postcard Lancaster Focal-plane, Goerz Celor F. 4.8 anastigmat lens, focal-plane shutter, speeded from 1/10th to 1/1,000th part of sec. and time, double extension, rack and pinion focussing, rising front, hooded back focussing screen, 3 dark slides, solid leather case; £14 14s.

Postcard Tropical Model Goerz Anschutz, Goerz Dagor Series III. F. 6.8 double anastigmat lens, focussing mount, focal-plane shutter, speeded from 1/10th to 1/1,000th part of sec. and time, direct vision finder, hooded back focussing screen, 3 double dark slides, solid leather case, as new; £26 10s.

½-pl. Goerz Anschutz, latest model, Goerz Dagor Series III. F. 6.8 double anastigmat lens, focussing mount, self-capping focal-plane shutter, speeded from 1/10th to 1/1,000th part of sec. and time, outside adjustment, direct vision finder, hooded back, focussing screen, 3 double dark slides, solid leather case, absolutely as new; £22 10s.

Postcard Teak Tropical Model Ernemann Focal-plane, Zeiss Tessar F. 6.3 anastigmat lens, in focussing mount, focal-plane shutter, speeded from 1/10th to 1/1,000th part of sec. and time, Russian leather bellows, direct vision finder, 3 double tropical dark slides, film pack adapter, solid leather case, unsoiled; £22 10s.

5 x 4 Zeiss Minimum Palmos, Zeiss Tessar F. 4.5 anastigmat lens, in focussing mount, focal-plane shutter, speeded from 1/10th to 1/1,000th part of sec. and time, direct vision finder, 3 double dark slides, leather case; £24.

No. 1a Speed Kodak, Goerz Celor F. 4.8 anastigmat lens, focal-plane shutter, speeded from 1/10th to 1/1,000th part of a sec. and time, long extension, rack and pinion focussing, direct vision finder, daylight loading, for film 4¼ x 2½, complete in solid leather case; £16.

5 x 4 Goerz Anschutz, Goerz Dagor F. 6.8 anastigmat lens, focussing mount, focal-plane shutter, speeded from 1/10th to 1/1,000th part of sec., direct vision finder, 3 double dark slides, leather case; £11 5s.

½-pl. Goerz Tropical Anschutz, Goerz Dagor lens, F. 6.8, focussing mount, focal-plane shutter, speeds from 5 secs. to 1/1,000th part of sec. and time, direct vision finder, 6 tropical double dark slides, leather case, in finest order; £15 10s.

Lever Press, for perforating proof prints "Rough Proof," complete, in perfect order; £1 15s.

Extra strong Lever Press, for impressing designs on mounts, will take die up to 3-in., and give impression up to 6-in. from edge of mount, perfect order; £1 17s. 6d.

FIELD AND STUDIO CAMERAS.

10 x 8 Square-bellows by Hare, finest Spanish mahogany, double extension, rising and cross front, swing and reversing back, Ross 10 x 8 rapid Symmetrical lens, F.8, 3 double bookform slides, leather case; £21.

10 x 8 Triple-extension Royal Ruby, compound rack focussing, extensive rising front, swing and reversing back, T.-P. shutter, Dallmeyer 10 x 8 R.R. lens, turntable, 2 double dark slides, and case; £23 17s. 6d.

12 x 10 Square-bellows Professional by Skinner, finest Spanish mahogany, double extension, rising and cross front, swing and reversing back, 12 x 10 Ross rapid Symmetrical lens, 3 double bookform slides; £24.

15 x 12 Square-bellows Ross, Spanish mahogany, double extension, rising and cross front, swing and reversing back, 16-in. Cooke Series V. anastigmat lens, 3 double dark slides, leather case; £39.

1/1-pl. Sichel Studio Camera, extra long extension, compound rack focussing, swing back and side swing, Ross Portrait lens, 4 repeating backs, complete on double-pillar ebonized stand, archimedean rack rise and tilt; £26.

15 x 12 Herbst Studio Camera, extra long extension, rack and pinion focussing, swing back, Ross Portrait lens, rack mount, one 15 x 12 roller-curtain slide, 1/1-pl. repeating back, two 1/1-pl. slides, double-pillar studio stand, archimedean screw rise and tilt; £25.

1/1-pl. Salex Studio Camera, very long extension, rack and pinion focussing, rising front, swing back and side swing, Dallmeyer 3B. patent Portrait lens, F. 3, soft focus adjustment, 2 1/1-pl. repeating backs, and carriers; £40.

1/1-pl. Studio Camera by Brooks, double extension, archimedean screw focussing, rising front, swing back, Fallowfield Portrait lens rack mount, 2 double repeating dark slides, one single; £10 5s.

1/1-pl. Spanish Mahogany Studio Camera, 14½-in. Cooke Series II. F. 4.5 Portrait lens, iris mount, soft focus adjustment, extra long extension, rack and pinion focussing, rising front swing back and side swing, 2 1/1-pl. repeating backs, and carriers; £17 17s. 6d.

15 x 12 Middlemiss Field Camera, double extension, rack and pinion focussing, rising front, swing back, R. R. lens, F. 8, 2 double dark slides; £12 10s.

1/1 pl. Sanderson Field Camera, extra long extension, Universal rising, falling and swing front, swing and reversing back, 10-in. Voigtlander Collinear F. 7.7 anastigmat lens, iris mount, 2 double bookform dark slides, in finest order; £24 10s.

½-pl. Spanish Mahogany Studio Camera, extra long extension, rack and pinion focussing, rising and falling front, swing back and side swing, Watson quick-acting Portrait lens, F. 4, complete with 2 repeating backs, one to take 2 postcards side by side; £15 10s.

½-pl. Professional Mahogany Enlarger, latest pattern, 8½ in. plano-convex condenser, all-way carrier, with rack revolving, rising and swing movement, extra long extension, compound rack focussing, rising front, special enlarging objective, Russian iron light chamber, with rack adjustment for centring light; £17 2s. 6d.

REFLEX CAMERAS.

½-pl. Ensign Model A Reflex, Goerz Dagor Series III. F. 6.8 anastigmat lens, focal-plane shutter, speeded from 1/10th to 1/1,000th part of a sec. and time, long extension, rack and pinion focussing, reversing back, 3 dark slides; £12 10s.

5 x 4 Goerz Folding Reflex, Goerz Dagor Series III. F. 6.8 double anastigmat lens, focussing mount, latest model self-capping focal-plane shutter, speeded from 1/10th to 1/1,000th part of sec. and time, also pneumatic adjustment to five seconds, deep focussing hood, reversing back, 3 double dark slides, leather case; £26.

P.C. Britisher Reflex, Cooke Series II. F. 4.5 anastigmat lens, self-capping focal-plane shutter, speeded from 1/10th to 1/1,000th part of sec. and time, long extension, revolving back, 3 double dark slides, film pack adapter, leather case; accept £24 10s.

½-pl. Popular Pressman Reflex, Velos F. 4.5 anastigmat lens, focal-plane shutter, speeded from 1/15th to 1/1,000th part of sec. and time, long extension, rising front, reversing back, deep focussing hood, 6 dark slides and case; £15.

3½ x 2½ Voigtlander Reflex, Busch Omnar F. 4.5 anastigmat lens, focal-plane shutter, speeds from 1/10th to 1/1,000th part of sec. and time, long extension, revolving back, 3 double dark slides, film pack adapter, leather case; £17 10s.

¼-pl. Staley Britisher Reflex, Ross Homocentric lens, F. 6.8, self-capping focal-plane shutter, speeds from 1/10th to 1/1,000th part of sec. and time, revolving back, spring-raised mirror, 3 double dark slides, film pack adapter, leather case; £17 10s.

3¼ x 2½ All-British Planex Reflex, Ross Homocentric lens, F. 5.6, focal-plane shutter, speeded from 1/10th to 1/1,000th part of a sec. and time, rack and pinion focussing, long extension, rising and falling front, revolving back, 6 double dark slides, and case; £16 10s.

½-pl. Marion Soho Reflex, Ross Xpres F. 4.5 anastigmat lens, focal-plane shutter, speeded from 1/16th to 1/800th part of sec. and time, rack and pinion focussing, long extension, revolving back, Mackenzie-Wishart slide, 12 envelopes, film pack adapter, solid leather case, in finest order; £32.

½-pl. Ensign de Luxe Reflex, Berthiot F. 5.7 anastigmat lens, self-capping focal-plane shutter, speeded from 1/10th to 1/1,000th part of a second and time, outside adjustment, extra long extension, rack and pinion focussing, revolving back, 3 double dark slides, condition as new; £36.

½-pl. Marion Soho Reflex, 8½-in. F. 4.5 Ross Xpres lens, focal-plane shutter, speeded from 1/16th to 1/800th part of a second and time, long extension, revolving back, 3 double dark slides, film pack adapter, leather case; £52 10s.

Postcard Butcher's Coronet Enlarger, polished oak, chain and sprocket focussing adjustment, 7 in. plano-convex condenser, negative carrier with rack adjustment, Petzval enlarging objective, rack mount, Russian iron light chamber, finest order; £12.

The City Sale and Exchange,

'Phone: 6981 CITY. **90-94, Fleet Street, London, E.C.4.** *Tel.: "Films, Fleet, London."*

Wratten Panchromatic Plates

Ordinary Plate.

[*Photos. by*

These two photographs of an antique, lacquer cabinet are examples of simple photography. They are reproduced to show the remarkable value of Wratten Panchromatic Plates compared with ordinary plates. Even in the coarse half-tone reproductions, you can see that the Panchromatic Plate shows all the beautiful colour work which the ordinary plate cannot render at all. It is as easy to use the Wratten Panchromatic Plate as it is to use the ordinary plate—then why not use the Wratten for all your work and secure the better negatives?

Write for free booklet, "Real Orthochromatism."

Wratten Panchromatic Plate.

W. E. Harper, Ludlow.]

Kodak Limited (Wratten Division), Kingsway, London, W.C. 2.

ENLARGEMENTS

Best results guaranteed and finest quality paper only used; 8½×6½, 1/-; 10×8, 1/3; 12×10, 1/6; 15×12, 2/3; up to 40 inches. Special quotations for quantities. Carefully mounted on suitable best quality plate sunk mounts and spotted, 8½×6½, 3/6; 10×8, 4/2; 12×10, 5/3; 15 × 12, 6/9. Making ¼-plate Negative from copy 1/- EXTRA.

Finishing in Black and White, Sepia, Water Colours & Oils.

POSTCARD PRINTING

Gaslight, Bromide, in all tones. Enamelled on plate glass matt and velvet surfaces.

AUTOMATIC BROMIDE — *Quick Despatch.*

B. & W. 1/10 — TONED 2/4 PER DOZ.

B. & W. 21/- — 27/- PER GROSS.

Per subject.

HAVE YOUR negatives properly titled with printed letters, by exclusive process; also celluloid border titles.

REAL PHOTO VIEW CARDS FOR PUBLISHERS . . . . 16/- per gross.

RETOUCHING at Photographers' own Prices.

DRY MOUNTING, BEVELLING, SKETCH FINISHED PRINTS.

All kinds of Trade Printing, Developing, etc., at prices consistent with good quality. Terms: Cash with order.

British Owned and British Labour only employed.

G. DROEGE, trading as

DROEGE & CO.,

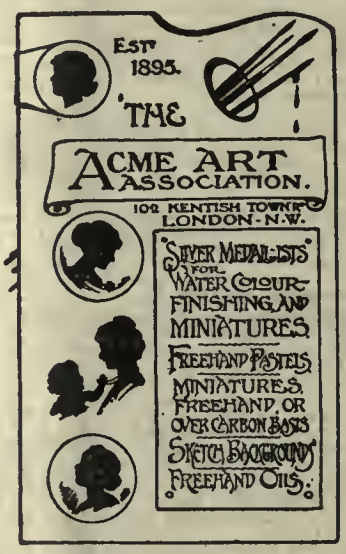
PHOTOGRAPHIC TRADE PRINTERS, PUBLISHERS & DEALERS.

OFFICES AND WORKROOMS:

43, Comeragh Rd., West Kensington, LONDON, W. 14.

Telephone No.: Hammersmith 1382.

Telephone: 530 HAMPSTEAD.



Please Note New Address:—

Burleigh House,
342, Camden Rd., N.7.

LNA LNA

¶ Every day increasing numbers of photographers in all parts of the country are realising the advantages of the L.N.A. Enlargements Service.

¶ They are finding that Enlargements made by the L.N.A. are excellent business bringers. Their fine pictorial qualities are most pleasing to customers. And the customers tell their friends.

¶ Thus the photographer finds that he gets more orders from his existing clients and, by recommendation, gains many new ones who otherwise might have gone elsewhere.

Write for Price List to PROFESSIONAL DEPT.,

The London News Agency Photos, Ltd.,
46, Fleet Street, London, E.C. 4.

ENLARGEMENTS

HENRY GREENWOOD & CO., LTD., PUBLISHERS, 24, WELLINGTON STREET, W.C.2, IN THE COUNTY OF LONDON.—December 26th, 1919.
Printed by ST. CLEMENTS PRESS, LIMITED, Newspaper Buildings, Portugal Street, Kingsway, London, W.C.2—N5743.

No. 146. VOL. XII. JANUARY 3, 1919.

THE BRITISH JOURNAL OF PHOTOGRAPHY

MONTHLY SUPPLEMENT

ON

Colour Photography.

CONTENTS.

PAGE
A New Photographic Mordant Dye Process. By F. E. Ives 1
Douglass Two-Colour Cinematography 2
Decennia Practica—Colour Photography: Lipmann or Interference Process of Direct Colour Photography—Pseudo-Colour Processes 3

A NEW PHOTOGRAPHIC MORDANT DYE PROCESS

[A communication from the Hess-Ives Laboratories.]

The first photographic mordant dye process to attract attention was the silver-iodide process of Dr. Traube (U.S. Pat. 1,093,503, 1914). Metallic silver photographic images converted to silver iodide and immersed in solutions of basic dyes become strongly coloured. If the dye is then fixed by tannin, the silver-iodide can be dissolved out, leaving a transparent dye image. Traube's method was improved upon by Tauleigne and Mazo (U.S. Pat. 1,069,917, 1913) who showed how to produce a silver-iodide image having a stronger affinity for the basic dyes, and, incidentally, that by first hardening the gelatine with alum and then treating the silver-iodide image with a strong solution of potassium iodide, it was made so transparent that for most purposes it was unnecessary to dissolve out the silver-iodide image. The step of hardening the gelatine in alum to prevent it from softening and dissolving in the strong potassium iodide solution was omitted in the U.S. Patent specification, but was published in the "British Journal Photographic Almanac, 1912," page 653. Hoyt Miller (U.S. Pat. 1,214,940, 1917), as a result of experiments with the process without alum hardening, declared the process unworkable, and broadly claimed the production and dyeing of a transparent silver-iodide image, he hardening the gelatine with formalin. I have myself operated the Tauleigne-Mazo process with perfect success.

Incidentally, it had been discovered that silver ferrocyanide, silver chromate and some other silver salts could be similarly dyed, but not with satisfactory results. Fox (U.S. Pat. 1,166,123, 1916) disclosed the fact that a vanadium-toned silver image mordanted basic dyes, and Crabtree and Ives (priority to Crabtree) independently discovered that a copper-toned image had the same property to a very notable and useful degree. The copper-toned image, like the transparent kind of silver-iodide image, is sufficiently transparent for most purposes without "fixing out," but can be made perfectly transparent by fixing in "hypo" without first fixing the dye image with tannin. It has the disadvantage for some purposes that the copper-ferrocyanide image is itself coloured (red-brown), and will not serve as the base for pure blue and green images. It has proved perfectly satisfactory for the production of orange-red images in combination with a cyanotype print in the same colloid layer in my coloured moving picture process (U.S. Pat. 1,278,668, 1918).

Recently I have discovered a new method of producing mordant-dye photographic images, which I think is superior to any heretofore known. The mordant is a chromium compound, the exact nature of which I have not yet determined, but it is not silver chromate, which is of a deep red colour, while the image which I produce previous to dyeing is of a very pure, though pale, yellow colour. It is produced very simply, quickly and cheaply by bleaching the silver image in a solution of equal parts of potassium ferricyanide and chromic acid, the action of which is analogous to that of potassium iodide in that if the solution is weak the image is not transparent, but if the solution is strong, the image is perfectly transparent and of a pale, though pure, yellow colour. It is necessary to wash out the free chromic acid after bleaching. The pale yellow image thus produced has a much stronger affinity for some of the basic dyes than either silver iodide or copper ferrocyanide. In fact, the silver image, for the best results, must be thin and superficial.

My bleaching solution is made with one ounce each of potassium ferricyanide and chromic acid in one gallon of water, at which strength it acts very quickly and produces a transparent yellow image. Transfer to running water should be made immediately when the image is completely bleached, to avoid over-hardening of the gelatine by the chromic acid. Long washing is necessary to clear out the free chromic acid, but it discharges rapidly in water containing a little soda bicarbonate, and the image also dyes up quicker and clears more rapidly after dyeing if the soda bicarbonate is used. I always use it, but too long immersion whitens the image, reduces its transparency, and produces a weaker, though still strong and brilliant dye image.

A typical dye bath is made by dissolving 10 grains of safranine in 4 ounces of alcohol and adding it to one quart of water made slightly acid with acetic acid. For complete dyeing, an immersion of half an hour or more may be necessary. This will stain the entire film deeply, after which it may be

cleared by washing in water containing a very little acetic acid. Other very active dyes are malachite green and auramine.

The images which have been whitened by long soaking in soda bicarbonate solution have the same appearance and transparency as silver ferrocyanide images, but have many times more mordanting power—more, even, than silver iodide.

F. E. Ives.

November 11, 1918.

THE PATENTED PROCESS.

In supplement to the above note by Mr. Ives we publish the details of the dye-toning process as set forth in the specification of the patent No. 115,617 granted jointly to him and the Hess-Ives Corporation, in which the process is described as follows :—

The invention may refer to any photographic image, whether negative, positive, or diapositive, and the method of producing the same, whether for the purposes of colour photography, monochrome photography, or motion picture photography.

As an instance of the principles of the invention, the production of a red positive image will be described, and in that connection it may be presupposed that a suitable negative such as the ordinary black or silver haloid negative has been obtained, which, in the case of colour photography, may be one of a set of colour-selection negatives representing, for example, the green elements of the subject.

The method may commence by printing an ordinary black diapositive. Next, this black positive is to be converted into a coloured positive. This is effected by a copper-toning process by which the silver image is converted into a copper-red image, the toned image being further treated to afford a satisfactory and permanent coloured photographic image of the proper depth and hue.

The silver or black positive is first soaked one or more hours in a copper-toning solution made up of the following solutions :—

Solution A.

Potassium ferricyanide	50 grs.
Potassium citrate	240 grs.
Water	20 ozs.

Solution B.

Copper sulphate	60 grs.
Potassium citrate	240 grs.
Water	20 ozs.

A mixture of equal parts of Solutions A and B gives the desired toning solution, and when the diapositive has been soaked for the requisite time, it will be found to have been converted into a copper-red coloured image. This image is somewhat degraded by the presence of silver ferricyanide, and it is, therefore, usually preferred to dissolve out this silver salt by the use of sodium thiosulphate ("hypo").

The copper-toned image thus produced is usually insufficiently deep or bright, or not of the desired hue, for colour photography or other photographic purposes. The inventors have discovered that the copper-toned image is capable of acting as an extremely efficient mordant for basic dyes, and the principle of the invention is the production of the coloured image by a combined copper-toning and mordant-dye process, it being believed to be new to produce a copper-toned image and then utilize the same for the mordanting of suitable dyes so as to strengthen or modify the photographic image to the desired depth and hue. The final image consists of the copper-red image combined with the mordant-dyed image.

In its broader aspect the invention may be carried out by subjecting the copper-toned image having a reddish colour to a bath of any soluble dye capable of being selectively mordanted by the copper image. Not only red but blue or yellow or other dyes might be so employed. Specifically, the case of increasing the depth or brightness of the copper-red image by means of a red dye will now be described, and it is to be understood that the mordant dyeing step can be carried out at any stage of the complete process, although it is preferred to effect the dyeing after the dissolving out of the silver salt so as to permit the exercise of the judgment by inspection and the stopping of the dyeing process at the most satisfactory point.

Having the copper-red positive free of the silver salt, this may be soaked in the selected dye-bath, for example, an aqueous solution of fuchsine dye containing a small quantity of acetic acid. Owing to the fact that copper is an effective mordant for certain alkali or basic dyes, including the one mentioned, the positive is caused to take up selectively a substantial amount of the fuchsine dye. After this treatment the positive should be washed out in water containing weak acetic acid so as to remove the unmordanted part of the dye from the colloid or gelatine containing the image. When dry, the positive is completed.

The copper-toned and mordant-dyed image of this invention is easy to produce, and is easily controllable during the process, and the image is particularly advantageous for use in connection with multi-colour photography, as no interference is caused with the successful blending of the image with images of other colours, for example, with a cyanatype blue image produced either before or after the mordant dyeing of the present invention.

The present process is very elastic, since the finished print may be tried out in the projection lantern or otherwise, and if it is found that the colour is not exactly as desired, it may be further modified either by adding or subtracting colour almost as readily as in initially carrying out the process. The colour may be enhanced by further mordant dyeing or may be reduced by soaking in acidified water.

In one respect it will be seen that this invention consists in first forming an insoluble or pigment image of material having strong capacity for mordanting and then reinforcing the image by dye-bath treatment, the dye being mordanted selectively so as to strengthen or modify the original image.

The fuchsine dye mentioned will give a purplish red result, whereas an orange red may be obtained by the use of auramine dye, and a mixture of the two or of other dyes may be employed so as to secure the results which are dictated by experience and the character of the subjects. An example of a satisfactory mixed bath is as follows :—

Fuchsine	0.13 gms.
Auramine	0.26 gms.
Water	5,000 c.c.s.
Acetic acid	8 c.c.s.

The dyes may be first dissolved in a little alcohol and then added to the water, and the dyeing process may be continued sufficiently to reach the limit of mordanting action, which may be one or more hours. The unmordanted dye in the gelatine may be subsequently dissolved out by soaking in water preferably made slightly acid.

The mordant dyeing of the copper-red image may be performed either before or after the dissolving out of the silver salt, and sometimes when the silver image is thin, the fixing thereof may be entirely omitted.

Since many matters of order and procedure, particular ingredients and colours, and other features may be variously modified without departing from the underlying principle

DOUGLASS TWO-COLOUR CINEMATOGRAPHY.

Particulars of the process of colour cinematography devised by Mr. L. F. Douglass are given in the extract, printed below, from his patent specification, No. 117,864. As was said in some notes on Mr. Douglass's work some months ago, he is one of the newer experimenters in this field, and we believe that he is now engaged on a process of a different kind.

The invention relates to natural colour cinematograph films formed from a negative series, the images in which have been taken through rotating colour filters, usually red and green alternatively. The process includes the masking of one set of alternate positive images with varnish during the subjecting of the other set to the colouring solution, so that there is no possibility

of the colour creeping or passing to the wrong set of images, and the colour is caused to be finally inherent in the emulsion coating of each set of positive images, so that it will not run or creep during washing of the film.

A positive film is first produced wherein every other image possesses a red or yellowish-red colour value and the remaining alternate images a green or green-blue colour value, this film being in black and white. By toning, tinting or dyeing, the red colour value images are then coloured red, and the green colour value images green, the colouring being produced by toning or tinting so that the finished coloured film is a unitary film wherein the colouring is inherent in the film itself, and each set of images (green or red) is masked and protected whilst the other set is being coloured. The images on the positive film are coloured, it will be understood, to correspond with the colour screens employed in taking the negative.

Toning consists in either wholly or partially replacing the silver image of the positive film by some coloured compound, the clear portions or high-lights of the image, consisting of plain gelatine, remaining unaffected and colourless. Tinting on the other hand, consists in immersing the film in a solution of dye which colours the gelatine itself, causing the whole picture on the screen to have a veil of colour over it.

The black and white positive film is coloured or dyed in the following way:—

All the pictures of red value in the film are first masked so as to protect the red colour value images against the action of the green or green-blue colouring solution, while these green or green-blue images are being toned or tinted. As a mask one may employ a suitable good quality dye-proof varnish which can be washed off without affecting the film. A suitable mask would be afforded by photographic varnish, dye-proof and soluble in alcohol.

The most suitable dye-stuffs for tinting are the so-called "acid" dyes which are alkaline—usually sodium salts of organic acids. The dye employed should be inert and not attack the gelatine or support. It should not "bleed" to any considerable extent when the film is washed. It should also be stable to light, and not be dichroic, and not change colour on dilution.

In the practice of the invention, certain desired colours may be obtained by admixture to reproduce any given tint. The dyes employed are standard dyes, for example, as follows:—

Name used in Formula.	Commercial Name.
Cine red	Chromotrop FB.
,, orange.....	Orange GRX.
,, yellow	Quinoline yellow.
,, blue-green	Brilliant patent blue.
,, blue.....	Naphthamine blue 12B

The above dyes are the commercial grades as supplied by the various dye makers, and contain on an average about 20% of loading material in the form of sodium chloride or sodium sulphate, which is in no way injurious to the film. A green dye that is suitable for this work is what is commercially known as acid green made by Wells and Richardson Co., Burlington, Vt. The proportions of these dyes are as follows:—

1 oz. 5 drams of blue-green dye to 1 oz. of the yellow and 10 gallons of water.

For the red dye I use 3 oz. of dye to 5 gallons of water.

For the special blue-green dye, furnished by Wells, Richardson Co. I use 6 oz. of dye to 5 gallons of water.

In all dye baths ½ oz. acetic acid is added to 1 gallon of water.

The time required for dyeing is from 1½ to 5 minutes. When the dye will no longer bring the film to the proper colour in five minutes it is considered exhausted and thrown away. The dye bath in practice is maintained at about 65° F. Since the red value pictures are varnished over or otherwise suitably masked, the green or green-blue dyeing in no way affects them.

The partially dyed film is then rinsed in water to remove any surplus of dye and where varnish is employed as a mask, the film is then immersed in ethyl alcohol of approximately 190° proof to remove the varnish.

After drying are masked all the pictures that have been dyed green, and all the unmasked pictures, taken for red value dyed, with the red dye set out above. The dyed film is again rinsed in water to remove any surplus red dye, the film dried and the masks removed.

If varnish has been used as a mask in the red dyeing operation, the same process is used for removing the varnish from the green coloured pictures as was employed above when removing the varnish from the red colour value pictures. The finished film has alternate pictures of red and green, or red and green-blue, and the film after being dried is ready for exhibition in a moving picture machine as in standard practice.

Although the tinting or dyeing by the method and means above described affects the colouration of the entire body of the gelatine, high-lights as well as the tones and half tones of the images, so that all the green pictures have a veil of green colour over their entirety, and correspondingly all the red pictures have a veil of red colour over their entirety, nevertheless when these pictures are projected on the screen in rapid succession, the green and the red in the high-lights neutralise each other, so that white light is seen on the screen. So far as the results are concerned to the observer, the whites of the projected pictures are apparently formed by directly transmitted white light.

The toning process does not affect the whites in the pictures of this improved cinematographic film; therefore, during projection there are passed only just such colours as are necessary to reproduce the picture in natural colours. Since the whites or high-lights in the images on the black and white positive are not coloured, or at least are less deeply coloured than other portions, the whites of the projected pictures are formed by directly transmitted white light.

As there is no change whatever in the projecting machine, strips of this film can be put in on the same reel with the black and white so part of the reel could be run in black and white, and part of it in colour, if desired.

By colouring the pictures, either by tinting or dyeing, or by toning, so that the colouring is inherent in the emulsion-coating of the film, not only a greater brilliancy, but a better definition and greater sharpness of outline is obtained; and very much less light is required than where any mechanical screens or filters or other mechanical colouring means outside the emulsion itself, are employed.

In this specification and in the claims the word "coloured" is comprehensive of tinting or toning, the result of which is to render the colouring matter inherent in the colour valued emulsion-coating of the film.

DECENNIA PRACTICA—COLOUR PHOTOGRAPHY.

Under this heading we apply to the various branches of colour photography the processes of collection and arrangement accorded to some fifty departments of ordinary photography in the "B. J." during 1916. These extracts are from issues of the "British Journal Almanac" of the years 1906 to 1915, and the present series of epitomes thus resuscitates and brings together in compact form much useful information, otherwise scattered through nearly a dozen volumes.—EDS. "Colour Photography" Supplement.

LIPPMANN OR INTERFERENCE PROCESS OF DIRECT COLOUR PHOTOGRAPHY.

Lippmann Formulæ.—Professor Cajal gives the formulæ he has found best in practising the Lippmann process. A bad sample of gelatine or inferior silver nitrate will cause impure whites or degraded colours. The gelatine sold by Lautenschlager, of Berlin, gives more brilliant results than Drescher's. The formula is as follows:—

Gelatine	62 grs.	4 gms.
Distilled water	3½ ozs.	100 c.c.s.
Potassium bromide	8.5 grs.	0.55 gms.

In summer the quantity of gelatine may be with advantage increased by 0.5 or 0.7 gms. (7.7 or 10.4 grs.).

The above should be placed in a glass beaker and heated in a water bath, with constant stirring, until the mixture attains a temperature of between 95 and 105 deg. Fahr. Then the sensitisers should be added:—

Cyanine, 1:500 alc. sol.....	84 minims	5 c.c.s.
Erythrosine, 1.500 sol.....	34 minims	2 c.c.s.
Glycin red, sat. sol. in abs. alc.....	135 minims	8 c.c.s.

The glycin red solution must be prepared only about an hour before use, as it rapidly precipitates.

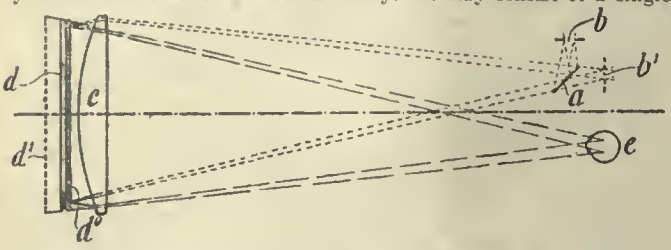
Immediately after the addition of the above the silver nitrate should be added all at once :—

Silver nitrate freshly powdered	11.5 grs.	0.75 gms.

The temperature of the emulsion may now vary between 77 and 105 deg. Fahr., but it is better to adhere to between 85 and 95 deg. Fahr.

If a very fine grain is desired, the emulsion should be gently stirred whilst the silver bromide is being formed; if, on the other hand, a more rapid emulsion is required, it is advisable to mix the emulsion in a bottle and shake it well. The author's experiences have proved that sensitiveness is to a great extent dependent on the physical phenomenon of agitation. The speed of emulsions can thus be made to vary between 1 and 3. It is also possible to increase the speed by digesting the emulsion for half an hour at 105 deg.—"B.J.," Sept. 13, 1907, p. 691.

Viewing Lippmann Heliochromes.—The Carl Zeiss Works have devised an instrument for viewing Lippmann interference photographs in which the viewing system is simultaneously used for illuminating the plate. The axis of the viewing system is arranged to one side of the photograph, but perpendicular to it. The lens system in this case is used eccentrically. It may consist of a single



plano convex lens cemented to the photograph as a cover glass. The drawing is a diagrammatic plan view of an apparatus for producing a virtual image by a Lippman photograph to be viewed with one eye. The image b^1 of the entrance pupil b projected by the mirror a is situated at the focal distance of the lens c, and is reproduced from this and from the photograph d, in as far as the picture-film reflects like a plane mirror, at the position of the eye e. The reproducing pencils produce simultaneously a virtual image d^1 of the photograph d behind the hinder surface of the photograph. There are no means provided in this simple example to abolish the catadioptric images of the entrance pupil, the axis of the lens c passing right across the photograph d. The latter is provided only with a plano parallel cover glass d^0.—Eng. Pat. No. 32, 1907; "B.J.," May 31, 1907, p. 414.

The Lippmann Process.—Experiments by Herbert E. Ives, recorded in a paper before the American Physical Society, have shown that the non-formation of laminæ at a distance from the surface of the film is due to the kind of developer ordinarily used—pyrogallic acid. This is brought out by sections made of the films, which, wetted so as to swell, are examined with the microscope. It is found that the photographic action extends through the thickest films practicable to flow. By using other developers, such as hydroquinone, even action throughout the film results If the developed image is then bleached with mercuric chloride a transparent deposit is obtained, and the reflected light consists of a spectrum band of only a few A.U. in width, the purity increasing with the thickness of film.

A substitute for the mercury mirror has been found. Celluloid varnish is flowed on silvered glass; on drying, the celluloid and silver strip off together. This flexible mirror is then laid on a wet Lippmann film and set to dry. Exposure is made as with dry-plates, the celluloid stripped off, and film developed.—"B.J." Colour Supplement, August 7, 1908, p. 60.

Ives Flexible Mirror.—H. E. Ives has made a series of experiments in order to discover the most favourable conditions (of thickness and grain emulsion, developer, etc.) for the reproduction of (1) pure monochromatic colours, (2) mixed colours, (3) white, and (4) natural scenes. In the course of his experiments he found that what is best for one of these is not best for others, and he further worked out a portable substitute for the mercury mirror, of particular value when using the Lippmann process in the field.

The following are his directions for making the latter: A glass plate is heavily silvered, and then flowed with a thick solution of celluloid in amyl acetate. When this varnish is dry, the plate is placed under water; this slowly works under the coating of celluloid, lifting it from the glass, and *bringing with it the silver.* This flexible silver mirror is immediately laid, silver surface down, on a wet Lippmann plate, and allowed to dry there, a necessarily somewhat slow process. When dry, the gelatine film has the silver surface in optical contact with it. The plate may then be exposed at any time in an ordinary plate-holder. After exposure, the celluloid film is stripped from the gelatine, taking with it most of the silver, the plate developed, and, after thorough washing, the remains of the silver removed with a tuft of wet cotton.

This substitute works perfectly for all types of colours, and, except in the laboratory, where a convenient dark-room makes the use of the mercury mirror simple, facilitates the practical working of the process.

A difficulty which has proved rather troublesome is that some of the best sensitisers are apt to lose their effect during the slow drying. Erythrosin acts perfectly; pinacyanol and pinaverdol are apt to fail. This can probably be overcome, either by different choice of sensitisers, by so treating these that slow drying does no harm, or perhaps by finding some more porous substance than celluloid, which acting the same in other respects, will permit of quick drying. Collodion has been tried, but has not been found to strip off the gelatine well.—"B.J." (from "Astro-Physical Journal"), Dec. 11, p. 942; Dec. 18, p. 965; Dec. 25, p. 979, 1908.

The Lippmann Process in Practice.—In a brochure issued by Messrs. Carl Zeiss, Jena, full details are given for the working of the Lippmann process by the methods and with the apparatus worked out by Dr. H. Lehmann, of the Carl Zeiss works. The apparatus includes a special form of mercury dark-slide and viewing and projecting instruments.—"B.J." Colour Supplement, Nov. 4, p. 83, and Dec. 2, p. 92, 1910.

PSEUDO-COLOUR PROCESSES.

"Mars-Star" Process.—Captain Lascelles-Davidson and Friese Greene have devised this so-called process in which a bromide print is bleached, and, after rinsing, treated all over with a series of colour washes, which act selectively upon the print. The inventors state that the densities (representing colour in monochrome) should be as nearly as possible as follows :—

White in the original scene should be opaque in the negative.
Blue should be semi-opaque.
Green should be of middle density.
Yellow should be of middle density.
Red should be of faint density.
Black should be of clear glass.

If the red developing compound is applied first only the red and yellow deposits in the print will be affected, and will develop up to a red. The blues and greens will not develop up until a developing compound for such colour is applied to the print, when the colour will be gradually re-developed and built up in the deposit of the print. The highest lights (whites) do not take any colours, and wash quite clean, unless the redevelopment has been carried on too far. It is only during the period of redevelopment that a bromide print shows power to select or repel a colour or colours, after which it becomes stained and untrue; but the latitude allowable in procedure before this stage is arrived at is very great.—"Penrose's Pictorial Annual," 1905-6, p. 85; "B.J.," Dec. 29, 1905, p. 1030

"Solgram" Colour Prints.—This alleged novel process of colour-photography, due to a Mr. W. C. South, of Downington, Pa., U.S.A., is severely criticised in "B.J.," February 2, 1906, p. 88. It appears to be nothing more than the superposition of gum-prints on a ferro-prussiate image.

No. 147. VOL. XII. FEBRUARY 7, 1919.

THE BRITISH JOURNAL OF PHOTOGRAPHY

MONTHLY SUPPLEMENT

ON

Colour Photography.

CONTENTS.

	PAGE
A Composite Colour Process	5
An Imbibition Screen-Plate Colour Process	8
Decennia Practica—Colour Photography:— Colour Separation by Dispersion and Diffraction	7

A COMPOSITE COLOUR PROCESS.

The following is the description, from the published specification, of a process for which patent protection in this country is granted to Mr. F. E. Ives and the Hess-Ives Corporation. It will be seen that the basis of it is the combination of a two-colour mosaic screen-plate and a single-plate sensitive to the other of the three primary colour-sensitives. Thus the screen-plate will record the green and blue-violet and the other plate the red. These two materials are arranged with their sensitive surfaces substantially in contact and exposure in the camera made through the mosaic plate. On development two negatives are obtained of the subject, one recording in the two sets of units of its mosaic the green and blue colour-sensations, and the other, over its whole area, representing the red colour-sensation. From this latter negative a blue-green positive is printed. From the two-colour composite negatives pink and yellow positives are printed, the former by green light and the latter by blue light. They may be made successively on a single sensitive surface or separately on two surfaces. The two or three positives—they are preferably dyed gelatine reliefs—are united to form the three-colour print. The specification No. 112,769 enters upon a percentage comparison of the results with those by other processes, but is not clear enough in its language for us to follow it.—Eds., "Colour Photography" Supplement.]

This invention involves a system of colour photography which is novel both in its entirety and in its parts. The primaries may be conveniently designated, as, first, blue; second, green; and third, red. The invention is characterised in that all three primaries are represented on two separate negatives produced by exposure and development of two sensitive films. This novel principle results by reason of one of the negatives being composite, that is, produced by exposure through a colour selective screen of mosaic or other pattern, and representing two of the primary colours, while the third primary colour is represented on the other negative, which is in some way rendered insensitive to or is protected from the first two primaries.

This invention is contrary and superior to the well-known three-colour mosaic system, such as that of Lumière, wherein all three primaries share the area of a single negative, and in consequence thereof are all insufficiently represented, especially red, the weakest colour. In the preferred embodiment of the present invention both of the stronger colours, blue and green, share the composite negative, and the weakest image is represented by an entire negative or 100 per cent. of the area. Moreover, where the positives are produced by a bichromated gelatine system, the three-colour mosaic system cannot be employed on account of the impossibility of printing the red-representing positive, since the bichromated gelatine is insensitive to red.

This invention is contrary and superior to the well-known system wherein three separate negatives, representing respectively the three primaries, are made by exposure of three separate sensitive members. That system, unless the exposures are made successively, or a special camera is used, requires the three sensitive members to be so assembled that the middle one separates the others. This destroys proper focus and sharpness of image, and makes the assemblage rather thick for use in an ordinary camera, and, moreover, the handling of three negatives is inconvenient.

The present system includes a novel sensitive assemblage. A two-colour selective screen or layer is preferably embodied with one of the sensitive members, so as to become a part of the resulting negative. This sensitive member is placed face to face with the second sensitive member with an extremely thin colour screen located between them or on the surface of one of the said members, and exposure is made with the composite colour screen at the front; the thin colour screen may be formed by flooding over one of the members a dye solution which would be allowed to dry thereon, and afterwards be washed out during the subsequent developing processes, the said screen being too thin to affect any material separation of the members. The resulting composite negative is reversed, which is an advantage in assembling the final print.

The present system includes also the novel mode of exposure wherein the light-rays pass first through the composite screen, so as to affect one sensitive layer in pattern and the other layer without pattern. The screen may have magenta-coloured areas for the blue-selection and yellow-coloured areas for the green-selection, the first sensitive layer being insensitive to red. These areas admit the red rays, which pass to the second sensitive member.

The present system includes also the novel procedure from the negatives by printing twice from the composite negative, preferably by light of two different colours (although a similar result is obtainable by having the sensitive print members of

two different sensitivities), so as to secure two positives to be blended with a third positive from the second negative. The novel picture or product is also superior, stronger in colour than the three-colour mosaic pictures of Lumière, and sharper than the pictures made from three separate negatives, and, when produced by the preferred embodiment of the invention, it consists of two patterned monochrome images blended with one unpatterned monochrome image, all of secondary colour.

The invention may be carried out in many ways, of which the one shown in the drawings is the preferred embodiment, and is given for illustration merely as a convenient example. The drawings are all greatly exaggerated.

In these drawings Fig 1 shows two sensitive members, either

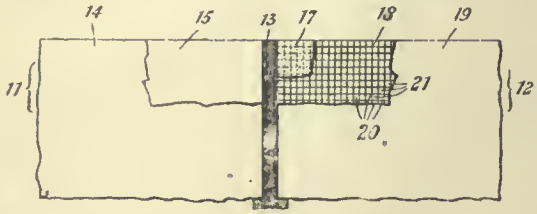


Fig. 1.

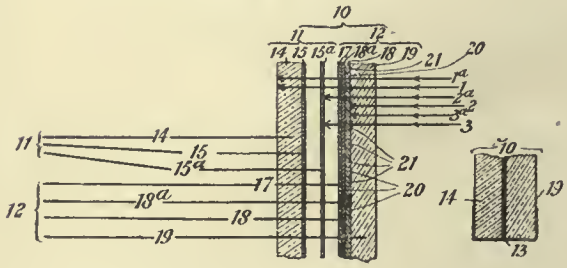


Fig. 3. Fig. 2.

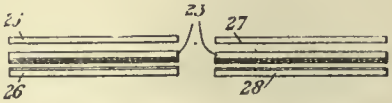


Fig. 4. Fig. 5. Fig. 6.

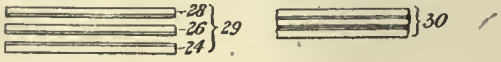


Fig. 7. Fig. 8.

rigid plates or flexible films, opened out flatwise. Fig. 2 shows them folded together into face contact. Fig. 3 diagrammatically shows the preferred arrangement and the passage of the light-rays. Figs. 4 to 8 show in side view one mode of making a colour photograph from the negatives produced by exposing the members of Fig. 1 to 3. Fig. 4 indicates printing from the plain negative a positive of secondary colour. Fig. 5 indicates printing from the composite negative by selected light, and Fig. 6 printing from the same negative by different light. Fig. 7 shows one convenient mode of blending the three positives—namely, by superposition, and Fig. 8 indicates these permanently united.

The pair or set of sensitive plates constitute a pack 10, comprising the rear member 11 and the front member 12. They may be secured by strip 13 at the edge, and are thus easily handled and permit exposure in an ordinary plateholder.

The sensitive member 11, which is to provide a negative representing the primary colour red, is preferably the rear member. It consists of a transparent carrier 14, preferably glass coated with a layer 15 sensitive to red. The layer 15 may be thoroughly insensitive to blue light and to green light, in which case practically all the light passing through the front member 12 may pass to it. It is safer, however, to exclude blue light, and even green, and, unless the layer 15 is insensitive to these colours, it should be protected by a screen or coating, or should be stained red. For illustration, a thin red screen 15a is indicated in Fig. 3.

It is preferred that the front sensitive member 12 be the one to afford the composite or mosaic negative. This faces rearwardly, and comprises, first, the layer 17 sensitive to both blue and green. In front of this is the composite screen 18, supported on a transparent carrier 19, preferably glass. A thin varnish coating 18a protects the colour pattern when applying the sensitive emulsion 17 over the screen.

By constructing the layer 18 of a microscopic pattern of magenta and yellow, it will pass blue light and green light respectively, according to the pattern, for affecting the front sensitive layer 17. The red rays, to which the front member is insensitive, pass through both the magenta and the yellow areas, and therefore affect the rear member 11 over its whole surface.

The member 12 may be made by coating the glass 19 with fine-grained gelatine, and then printing the desired pattern by a greasy ink. This may be of carmine or magenta colour. By then immersing in a yellow dye, the unprinted portions absorb the yellow colour, giving the desired composite screen. The yellow portions 20 are alternated with the magenta portions 21. This should be coated with amyl-acetate collodion varnish 18a before applying the blue-green-sensitive emulsion 17.

Fig. 3 shows the red rays passing through the magenta and the yellow units and through the red layer 15a to the rear member 11. The red screen is shown as cutting off the green and blue rays. The topmost green ray is shown passing through a yellow unit, so as to affect the sensitive layer 17. Yellow is secondary and admits both red and green, but excludes blue. The next green ray meeting the magenta unit is shut off. The first blue ray meeting the yellow unit is shut off. The second blue ray passes through the magenta unit and affects the sensitive layer 17. Magenta is a secondary colour and admits both red and blue, but excludes green. It may be tinged with yellow, so as to soften the effect of the blue light, which is far stronger than the green. This equalisation might be otherwise obtained, namely, by a yellow screen at the lens.

On development of the members 11 and 12, two negatives are obtained. The member 11 gives a plain or unpatterned negative 22, shown in Fig. 4, which represents the red element of the picture. The member 12 develops into a composite negative 23, shown in Figs. 5 and 6. The composite screen 18, being a permanent part, is contained in this negative. The image of the exposed and developed parts of the negative is black and represents the green and blue elements of the picture respectively. Beneath are the magenta and yellow units.

In Fig. 4 a positive 24 is printed from negative 22. This, according to the theory of subtractive colour photography has a blue-green image, and may be, for example, a ferrocyanide print. This colour is the complementary of red. From the composite negatives magenta and yellow positives are obtained. Fig. 5 shows printing the magenta positive from the negative 23 by green light. A green glass 25 is placed above. The image of the print 26 is to be made magenta in a suitable way. Similarly in Fig. 6 a blue glass 27 serves to give the positive 28, the image of which should be the complementary colour yellow.

These successive monochromes could be made successively on the same base, or made separately, as indicated, and afterwards combined. Thus, the positives 24, 26, 28, are shown superposed in Fig. 7, giving an assemblage 29, in which the original picture is reproduced. These may be permanently and intimately united, as in Fig. 8, to form the final product 30. The sensitive member 12 facing rearwardly gives a reversed negative 23,

so that the positives 26 and 28 are reversed. This is an advantage, as it enables one to face them downwardly, as in Fig. 7, upon the upwardly facing blue-green positive 24, which is unreversed.

The three positives 24, 26, 28, may be gelatine reliefs produced by the bichromate process; white light being used to print from the negative 22. The colour may consist of dye absorbed by the reliefs, and the three images could be transferred by imbibition to a single gelatine layer to give the final picture. The pattern or mosaic may be readily made to disappear by minute diffusion of the light or of the dye.

As before stated the foregoing description is that of the preferred embodiment of the invention; the manner of carrying the invention into practice is, however, capable of being considerably modified, and although some of these modifications, as hereinafter explained, may be responsible for different or less satisfactory results, nevertheless, they are all held to fall within the scope of the invention.

It has already been herein demonstrated that with a composite screen comprising only magenta and yellow areas the red or weakest image is represented by an entire negative or 100 per cent. of the area, and from that it will be appreciated that, when the total magenta area bears a certain definite proportion to the total yellow area, the resultant negative will be representative of 50 per cent. blue and 50 per cent. green, so that in all a total of say 200 per cent. will be obtained.

Any variation of the relative totals of the magenta and yellow areas of the composite screen will disturb only the balance of the blue and green in the resultant negative without in any way varying the 100 per cent. red negative and from this it will be seen that by giving effect to any such variation the green can be made to preponderate over the blue or vice versa in the finished product, thus affording considerable latitude in the artistic treatment of different subjects.

The foregoing description has been confined to examples in which the two areas of the composite or mosaic screen are both of secondary colour which is the only way of obtaining 100 per cent. representation of the red or weakest image, it is, however, possible, in accordance with the present invention for one of these areas to be of primary colour. Such an arrangement would secure results which, although less satisfactory than that just stated, would nevertheless be superior to those attained by hitherto known processes, inasmuch as equality for the three primary colours, say 50 per cent. of each, would be obtained, but in this case the red itself would be of mosaic pattern, that is to say in distinct areas alternating with black or clear areas.

To state a concrete example of the last-mentioned modification, it is assumed that the composite screen comprises alternating areas of magenta (secondary), and green (primary). With such a screen the magenta areas pass blue rays which affect the rear member 11 over only such areas as correspond with the said magenta areas, while the green areas pass only the green rays which affect the front sensitive layer 17, but have no effect on the rear member 11. The consequential result is that after development, the red representing negative 11, will have a mosaic pattern of red representing areas alternating with blank or clear areas, the total result being to secure 50 per cent. blue, 50 per cent. green, and 50 per cent. red.

The original yellow areas 20 might be retained, and the magenta areas replaced by blue, in which case the result would be substantially the same as in that of the last cited example. It would then, however, be possible to vary the size of the respective colour areas, for example, they might be in the proportion yellow areas 60 per cent., blue areas 40 per cent., which would give final totals of colour representation as follows: blue 40 per cent., green 60 per cent., red 60 per cent.

With the before-mentioned three-colour mosaic system of Lumiere the best results that can be obtained are 100 per cent., and, assuming the starch grains to be equally distributed, there is 33⅓ per cent. blue, 33⅓ per cent. green, 33⅓ per cent. red, and any increase of one must be at the sacrifice of the others.

It is well known that red and green are both far less actinic than blue, so that even with the blue 40 per cent., green 60 per cent., and red 60 per cent. previously mentioned, this is far better than has been hitherto possible from the best previously known process.

DECENNIA PRACTICA—COLOUR PHOTOGRAPHY.

COLOUR SEPARATION BY DISPERSION AND DIFFRACTION.

Colour Photography without Filters.—The Drac method briefly described in "B.J.A.," 1906, p. 853, was demonstrated privately in London during February and March, 1906. The apparatus (Eng. Pat. No. 1,008, 1904) provides for the dissection of the spectrum, permitting of the adjustment of the composition and strength of each section to the sensitiveness of the plate so as to obtain the same time of exposure for all three negatives. The apparatus is employed both for the making of the colour-sensation negatives and for the viewing or projection of colour records by additive synthesis. For the latter purpose the positive transparency from the triple negative is placed in the position occupied by the plate, and thus a system of direct colour photography is available in which no coloured means of any kind are used.—"B.J.," Feb. 2, 1906, p. 87.

A later patent of Drac's (Eng. Pat. No. 9,449, 1905) describes modifications in the system of prisms whereby fewer glasses are needed. Drawings, etc., are given in "B.J.," Feb. 9, 1906, p. 111.

Herbert E. Ives (son of F. E. Ives), in examination of the Wood diffraction process ("B.J.A.," 1900, p. 830; and 1901, p. 829), finds that it is erratic, in consequence of the fact that the three gratings, when superimposed, do not act as separate gratings. A new compound grating is formed by two of the replicas getting in and out of step with each other, and this new grating forms a spectrum of its own. In order to avoid the disturbing effects of superimposition, Ives arranges the gratings in strips, applying the principle of Joly's process to the diffraction method. The improved plan is as follows:

In Fig. 1, A is the bichromated gelatine plate rigidly fixed in position; B is a glass diffraction grating; C is a line screen, ruled with at least two hundred lines to the inch, with the opaque lines twice the width of the transparent; and D a lens, and E a positive colour-record to be copied. The latter is an ordinary set of three positives containing no lines or structure, and the grating is an ordinary continuously-ruled one. With, say, the red record at E, and the corresponding grating at B, an exposure is made, resulting in a series of narrow strips. A second positive is then placed at E, the corresponding grating at B, and the ruling C moved the width of a transparent portion. A second exposure is then made, the opaque lines shielding the previously exposed surface, and a similar treatment given to the third positive. There results finally a picture made up of alternating strips of three different gratings.

To eliminate the grating effects of the narrow strips of gratings considered as lines, the device is used of making the strips (Joly lines) run at right angles to the diffraction grating lines, so that the spectra produced by them are thrown off in another direction and do not enter the eye.

Fig. 2 gives an idea of the appearance of the finished picture under the microscope. The short, fine lines are the diffraction grating lines furnishing the three primary colours; 2,400 to the inch for the red, 3,000 for the green, and 3,600 for the blue.

When viewed with a lens and bright source of light the pictures made in this way are entirely free from the formerly-obtained defects. The colours are pure and brilliant, and, unlike ordinary Joly pictures, the colour-lines are too fine to be visible. The results, indeed, approach those obtained with the Kromskop.

As a further modification of the original method the writer has found it possible to dispense with three gratings and obtain the colours with a single grating spacing properly used. To do this the source of light must be a rather long slit. Viewed through a

grating the slit, of course, gives long spectra parallel to its length. If now the grating be rotated about the perpendicular dropped from it to the slit, the spectra move in toward the slit. [The accompanying shift parallel to the length of the slit is compensated for by the slit being long.] So, by suitable rotation, any desired spectrum

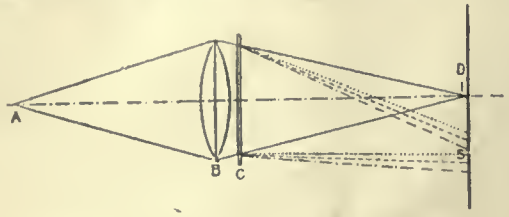


Fig 1

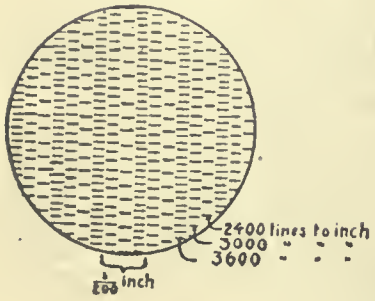


Fig. 2

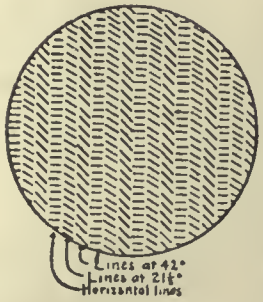


Fig. 3.

colour may be obtained at a chosen point. Starting with a grating of 3,600 lines to the inch to give the blue when parallel to the slit, a rotation of about 21½ degrees will give the green, of 42 degrees the red. In the absence of suitable dividing engines to rule three properly-proportioned gratings this affords an exact and easy method of securing the three colours. It has the fourth advantage, that in printing copies such difficulties as securing perfect printing contact will affect all three colours alike, which is not the case with gratings of different degrees of fineness.

Fig. 3 shows a portion of a picture made in this way with one grating spacing.

Mr. F. E. Ives has devised the following instrument for viewing the pictures :—

Fig. 4 gives the instrument in section. A, B, C, D are the four slits; M a mirror; L_1 and L_2 lenses; P the diffraction picture; and S the slit through which the picture is observed. The lenses, of course, form an image of each slit at A^1, B^1, C^1, D^1; from each of these images, however, a certain amount of light is diffracted by the

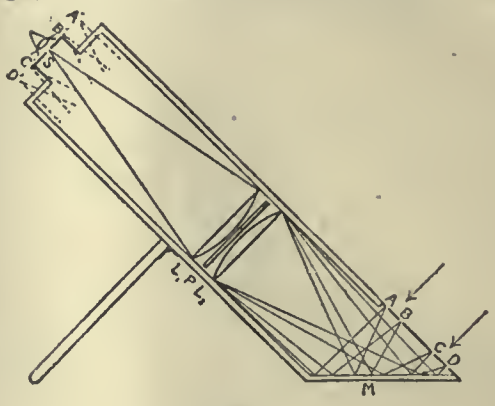


Fig. 4.

picture P; from B and C first order spectra fall on S, from A and D, second order. The use of second as well as first order spectra is a distinct advantage in that, as gratings never give a perfectly uniform distribution of light and colour, certain desirable qualities of the picture are found in one order and not in the other, while if both orders are used the resultant evening up of qualities produces particularly satisfactory results.

By disposing the grating lines in a horizontal direction and using horizontal slits as sources, the pictures may be viewed by both eyes, a desirable condition for convenience and comfort. To use, it is merely placed before a window or Welsbach light and the pictures dropped to place.—"B.J." (from "Journal of Franklin Institute"), Aug. 3, 1906, p. 609.

AN IMBIBITION SCREEN-PLATE COLOUR PROCESS.

A RECENT patent specification, No. 121,776, of Hans Pedersen, describes a method of making colour prints by a process which combines within itself certain details familiar in other processes.

In reciting the known state of the art in the field of his invention the patentee points out that it has been proposed to produce from a colour diapositive—i.e., a three-colour original positive, for example, an Autochrome plate, another similarly coloured positive view or picture on paper, by using the same method that has proved so successful with plates—that is to say, to expose a sensitized bromide film beneath a positive, comprising a screen of primary colours, to develop and then reverse and fix it. However, to enable the light to reach the eye from such a picture so as to reveal the colours, the light would have to pass twice through the screen or filter, and would thereby be weakened so far as to render the picture seen by the eye, to be lacking in contrast, thus making this method impracticable.

He also points out that, by another known method, a positive reproduction can be had direct from a multi-colour dia-positive by first producing a print therefrom on pigment paper coated with a white pigment and transferring the pigment image on to a black paper backing, then placing a coloured layer in correct register on the pigment coating and allowing the picture to imbibe colours, so that there is obtained a positive picture with correct distribution of light and shade.

According to the improved method the required colours are imbibed from a multi-coloured substratum layer or screen, and for this purpose a transparent base is covered with a screen of not too small meshes and of waterproof colours, which are only soluble in alcohol, for example. Directly on this filter is placed a sufficiently thick gelatine-silver colour-sensitive film, having white pigment incorporated in it. The subsequently mentioned separate treatments are based on well-known general treatments or methods, to which reference only is needed here.

An exposure is made beneath a multi-coloured dia-positive or in a camera, as in taking ordinary exposures from the rear through the screen. The image is then developed in non-tanning developer and fixed. The silver deposit is bleached in one of the known bleaching agents which differentially tan the developed parts in accordance with the silver deposit, and is then fixed so as to remove the newly-formed bromide or chromate of silver. The gelatine which has remained soluble is now dissolved in a warm-water bath similarly as is done in the well-known "carbon" process. The remaining white pigment is thus distributed correspondingly to the distribution required in the colour screen picture. On a red spot, for example, only the red parts of the screen are covered with pigment, the others lie free. At a black part the whole screen is free, while at the white parts all the screen is covered. The thickness of the pigment layer corresponds everywhere with the amount of light received by the sensitized film.

After this the pigment layer is pressed on to an alcohol-soaked colourless gelatine layer. The alcohol penetrates through the pigment and causes the colours of the screen to dissolve and penetrate into the white pigment. The colours not covered by pigment pass into and are wholly absorbed by the firmly-pressed-on gelatine layer. When the colours have been sufficiently absorbed by the pigment the two layers or films are separated from each other. For interrupting the colouring action the solvent in the pigment is made to quickly evaporate by means of a warm air current. The white pigment has now been changed to a coloured picture with the correct scale of density according to the different thickness of the layer. By double transfer the withdrawal of the pigment from the screen and its application to a black paper backing is effected. This method is equally suitable for copying, enlarging, and for directly taking photographic views.

No. 148. VOL. XII. MARCH 7, 1919.

THE BRITISH JOURNAL OF PHOTOGRAPHY

MONTHLY SUPPLEMENT

ON

Colour Photography.

CONTENTS.

	Page
Colour Transparencies from Colour-Sensation Negatives	9
Decennia Practica—Colour Photography	11

COLOUR TRANSPARENCIES FROM COLOUR-SENSATION NEGATIVES.

[A method of printing from colour-sensation negatives which appears designed for the production of complete colour-cinematograph film pictures is described in a recent patent specification assigned by F. E. Ives to the Hess-Ives Corporation, Philadelphia. It consists essentially in producing a multi-coloured picture by forming a composite of (1) a positive from a colour-sensation negative and (2) a positive printed from a positive or negative from a second colour-sensation negative and impressed on (1). Inasmuch as details of such processes are appropriately recorded in these pages we have transferred them from their customary place in the "Patent News."—Eds. "Colour Photography" Supplement.]

This invention relates to the art of colour photography, and has more particularly to do with the process involved in the making of a multi-colour photograph compounded of blended monocolour images of which one or more are printed directly upon a pre-formed colour image. In its complete aspect the process may be said to commence with a set of colour-selection negatives, whether of the two-colour or three-colour system, or other system, which negatives are producible by well-known methods; and the invention provides a novel and advantageous mode of proceeding from such negatives to secure the multi-colour positives or pictures. In one aspect the invention may be said to be directed more particularly to the subject of motion pictures in colour, in which, on account of the minute size of the images, it has been found difficult to secure or ensure exact registration of the component images. The invention, by overcoming such difficulties, prevents the incidental formation of fringes of colour in the making and exhibiting of colour motion pictures.

For convenience the invention is described as applied to the two-colour system, wherein red and green respectively may be considered as the selected primary colours, and blue-green and red respectively the corresponding secondary or complementary colours. While the invention is applicable to many systems wherein the monochrome components of the positive image are produced successively, the later one being produced directly upon and in registry, so as to blend, with the earlier one, it is, for convenience, described as an improvement of the known process in which, after obtaining the negatives representing the selected primaries, which may be respectively referred to as the red-representing negative and the green-representing negative, a monochrome positive is made from one of the negatives. Specifically a blue-green positive is produced directly from the red-representing negative, this coloured positive being carried in a gelatine film on a suitable support. The green-representing negative, or a diapositive therefrom, is then used to print a red image directly upon the blue-green monochrome print, in registry with the blue-green image. This is preferably done by bichromate sensitising of the gelatine film containing the blue-green image, and then exposing beneath a diapositive from the green-representing negative and thereafter dyeing the exposed colloid by suitable red dye which is selectively imbibed, forming an image blending with the blue-green image and yielding the desired multi-colour print. It will be understood that the negatives and the green-representing diapositive referred to are the usual black, or rather black and clear, negatives or diapositives. To avoid confusion the word colour or coloured throughout this specification is used in a sense distinguished from black or clear.

In practising the before-mentioned known process much difficulty has been experienced in securing accurate registration of the black green-representing diapositive over the previously formed blue-green monochrome positive. Practically speaking, visual registration is necessary, at least in the first instance, and it is found that the most minute visual examination, however carefully made, has not availed to ensure exact registration. The difficulty is enhanced in the case of cinematographic films where the details of the pictures are substantially microscopic, and where, moreover, the slightest inaccuracy in registration is immensely magnified in projecting the picture upon the screen. Inaccuracy in registry means that one or other of the colour images, the blue-green or the red, will overlap at various points, thus producing bright colour fringes in the projected picture, which is extremely objectionable.

The objects of the present invention are generally to overcome the various defects above mentioned, and particularly to over-

come the difficulty in obtaining exact registration in the printing of a second monochrome image over a pre-formed positive print of another colour. Other objects and advantages are explained in the following description or will be apparent to those skilled in the art.

In one aspect the present invention particularly consists in the process of making a blended picture after having secured a pre-formed colour print or positive, by photographically printing a differently coloured image in registry upon, so as to blend with, the pre-formed colour print by effecting a photographic exposure through a diapositive, or in some cases a negative, which, contrary to the usual black and clear diapositive or negative, is of a colour which effectively contrasts with that of the pre-formed print, so that the eye is easily enabled to effect exact registration before exposing to light to print the second image. By these means the hitherto experienced difficulty arising out of the fact that the black and clear diapositive affords insufficient contrast with the pre-formed monochrome image during the step of registry, is thus overcome. More specifically, after securing the first colour image, it is preferred to use for printing of the succeeding one a diapositive of the complementary colour, so that during registry the observer practically has before him the final multi-colour or blended image. Specifically, after securing the blue-green positive in gelatine and re-sensitising, a red diapositive secured from the green-representing negative is employed, and with this red diapositive registration above the blue-green image is easily and satisfactorily made prior to the actual exposure and subsequent selective dyeing of the gelatine.

In order to afford a full and complete disclosure of the present invention and the mode of practising it, one practicable mode of procedure and details will now be described step by step.

In the accompanying drawings illustrative of one application of the present invention fig. 1 in side elevation indicates a red-

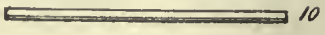


Fig. 1.

selection negative, fig. 2 a green-selection negative, and fig. 3 a diapositive from the green-selection negative. Fig. 4 indicates the step of printing a blue-green positive from the red-selection negative, fig. 5 the step of printing a red image from the fig. 3

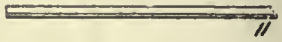


Fig. 2.

diapositive in registry upon the blue-green image, and fig. 6 on an enlarged scale shows the nature of the resulting print. Fig. 7 shows a modification.

Commencing the description of the invention at that point where the colour selection negatives have been obtained, and assuming that one of these (fig. 1) represents red and the other (fig. 2) green, these being the selected primaries, the subsequent procedure may be described as follows:—

Before producing a blue-green positive from the red selection negative, 10, it will be convenient to first secure the red diapositive from the green-representing negative, 11, for the purpose of using such diapositive in exposing and printing the second of the two monochrome images to be blended.

From the black negative, 11, which represents green, a black diapositive, 12, is printed, which may be done in a well-known manner, for example, by merely exposing a silver haloid sensitive plate or film beneath the negative, and developing in the usual way. The black diapositive is next converted into a red diapositive, and the procedure for this may be as follows:—

The diapositive is first soaked over night in a copper toning solution made up of the following solutions, which can be kept in stock:—

A—Potassium ferricyanide	.....	50 grains.
Potassium citrate	.....	240 grains.
Water	.....	20 ounces.
B—Copper sulphate	.....	60 grains.
Potassium citrate	.....	240 grains.
Water	.....	20 ounces.

A mixture of equal parts of solutions A and B gives the desired toning solution, and, when the diapositive has been soaked for the requisite time it will be found to have been converted into a copper red coloured image. This image is somewhat degraded by the presence of silver ferrocyanide, and it is therefore preferred to dissolve out this silver salt by the use of sodium thiosulphate ("hypo").

It is preferred that the diapositive, 12, should be of a deeper and brighter red than the copper red so produced, in order to

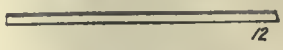


Fig. 3.

give a more emphatic contrast when registering with the blue-green image, and this result may be accomplished as follows:—

The copper red diapositive may be soaked in an aqueous solution of fuchsine dye containing a small quantity of acetic acid. Owing to the fact that copper is a mordant for certain alkali dyes, including the one mentioned, the diapositive is caused to

Fig. 4.

take up selectively a substantial amount of the dye. After this treatment the diapositive should be washed out in water containing weak acetic acid, so as to remove the unmordanted part of the dye. The red diapositive, 12, when dry is ready for

Fig. 5.

printing purposes, and it will be understood that it is a green-representing diapositive, coloured red to contrast vividly with the blue-green monochrome.

The subsequent procedure has already been referred to. The red-representing negative, 10, will first be utilised to secure a blue-green positive image, which may be done by a known silver conversion system, or by any other convenient system. This step is indicated in fig. 4, in which, beneath the negative, 10, is seen the print member, 13, comprising the sensitive layer, 14, over the carrier or glass, 15.

Having the blue-green positive image, the second image may be produced in different ways. One well-known procedure would be to first coat the blue-green image with a protective coating of varnish, 16, as indicated in fig. 7, and apply over that a sensitive layer, 17, before proceeding to expose and print for the red image. Or, as is already known, the blue-green image may be contained in a gelatine layer, 14 (see fig. 5), which may now be sensitised with potassium bichromate. This re-sensitised monochrome may now be exposed beneath the green-representing red-coloured diapositive, 12. This, as previously explained, is easily and accurately performed by reason of the colour contrast between the red diapositive and the blue-green positive image. Following this it is merely necessary to wash out the unaffected bichromate, and immerse for one or two minutes in an acid solution of sodium salt of di-sulpho-naphthaleneazo-B-naphthol disulphonic acid, known as fast red or similar dye. By this procedure the red image will be created

by selective absorption, and will be found to be accurately registered with the blue-green image, and therefore properly blended, so that, when magnified by projection on a motion picture screen, the objectionable colour fringes will be substantially non-existent.

In enlarged cross-section the final picture may be somewhat as indicated in fig. 6, wherein above the transparent carrier, 15,

Fig. 6.

the layer, 14, of colloid is shown as having embodied in it the blue-green image, 18, and the subsequently formed red image, 19, the lower part of the colloid layer being clear, as shown at 20.

In cases where it is desired to use a coloured negative as the printing member for the second image, instead of the coloured

Fig. 7.

diapositive, the original black negative may be suitably converted to a red colour, for example, in the manner above described, and in this case a different mode of selectively producing the second image will have to be adopted, for example, the use of a dye like eosine, which is mordanted by the chromium compound produced in the film by exposure to light, but can be washed out of the unhardened portions, thus producing a red positive image by printing under a negative image.

The particular colours mentioned are only instances, and they may be reversed or suitably altered according to the system of primaries and secondaries that may be selected. In the particular two-colour system referred to, the red image may be of various shades of red as circumstances may dictate, and the blue-green image may vary from blue to green, and may, therefore, be referred to as a blue-to-green image.

Other methods than the one given may be employed for converting a black silver image to a coloured image, as required for this process, for example, that already known wherein the silver image is converted to silver iodide and subsequently dyed with an alkali dye which is mordanted by silver iodide; and a silver image converted to silver ferrocyanide will dye selectively with alkali dyes in the same manner. The copper red image is preferable for the object of the present invention because of its intrinsic colour and superior opacity to actinic light, and the greater permanency to light of alkali dyes in combination with the copper mordant.

The claims which are made in respect to the invention are:—

1. In the production of a multicolour photograph, printing a monochrome positive of a secondary colour corresponding to the first primary, producing a coloured printing member, negative or diapositive, contrasting in colour with such positive, and then printing from said coloured printing member in registry upon said positive an image of, or one which is subsequently dyed or coloured to, a red or other secondary colour corresponding to the second primary.

2. In the art of colour photography the process of making a multicolour photograph from a set of coloured selection negatives which represent the respective red and green or other selected primary colours, said process consisting in printing from one negative, say the red-representing one, a monochrome positive of a blue-to-green or other secondary colour corresponding to the first primary, producing from another negative, say the green-representing one, a coloured printing member, negative or diapositive, contrasting in colour with such positive, and then printing from said coloured printing member, in registry upon said positive an image of, or one which is subsequently dyed or coloured to, a red or other secondary colour corresponding to the second primary.

3. In the art of colour photography the process according to Claim 2 characterised by the resensitising of the monochrome positive of secondary colour corresponding to the first primary before printing thereon or therein the image of secondary colour corresponding to the second primary.

4. In the production of a multicolour photograph according to Claim 1 wherein the coloured printing member is a red diapositive, producing said diapositive by copper-toning a black diapositive to a red colour.

5. A multicolour photograph produced by the process claimed in the preceding Claim 1, Claim 2, or Claim 3.

DECENNIA PRACTICA—COLOUR PHOTOGRAPHY.

Under this heading we apply to the various branches of colour photography the processes of collection and arrangement accorded to some fifty departments of ordinary photography in the "B. J." during 1916. These extracts are from issues of the "British Journal Almanac" of the years 1906 to 1915, and the present series of epitomes thus resuscitates and brings together in compact form much useful information, otherwise scattered through nearly a dozen volumes.—EDS. "Colour Photography" Supplement.

PSEUDO-COLOUR PROCESSES.

Captain W. Lascelles-Davidson has patented a process for producing natural-colour prints from negatives taken in the ordinary way through a screen. In this negative—

White should be opaque.
Blue should be semi-opaque.
Green should be middle density.
Yellow should be middle density.
Red should be faint density.
Black should be clear glass.

A red positive is first made by any known colour process printed from the negative, taking care that only the clear portions of the negative (representing black) and the most faint density (representing the reds) only are printed. This red positive (from the second operation) is registered in close contact with the same negative, and a fresh positive is printed again in yellow or green (by any known colour process) on another surface until the middle density only is printed. A red positive is made first, and then superimposed on the same negative before printing the next colour (yellow or green), because the red positive is required to act as a light shield, so that it will block out the red density in the negative and prevent it from printing again on the next colour, unless the colours happen to blend, when, of course, the gradation and density of the negative will step in and give the required impure or mixed colour or colours. We now have a red and yellow (or green) positive, each picking out its own colour and mixture of colours. We have simply to superimpose the red and yellow (or green) positives on each other and place them in register with the same negative, and print the next density (blue) by any known colour process in blue, the red and yellow (or green positive) serving as light shields to prevent other densities from printing in the wrong colour. We shall have now three positives in red, blue, and yellow (or green) respectively, each positive picking out its own colour according to the density of the negative, and to make a picture from the negative as true as possible in colour to the

original scene. We print (without any positive shield or shields) a light monochrome positive in black from the same negative (to give black in clear portion of negative), and when we superimpose and register the red, yellow (or green), and blue positives (or in any suitable order or degree of colour) on the monochrome positive the picture will be a complete triad of colour, the monochrome print giving the black, and the red, blue, and yellow (or green) positive giving all the other colours and mixture of colours when registered and superimposed on each other. Alternative methods of carrying out the same idea of the light-shield by photographic and photo-mechanical processes are described.—Eng. Pat., No. 16,104, 1905; "B.J.," Sept. 7, 1906, p. 711.

Carbon Tissue for Multi-Colour Prints.—E. N. White has patented pigment tissue coated with a series of layers of gelatine mixtures containing pigments for the production of colour effects by printing from ordinary negatives. The paper is first coated with a mixture containing a white pigment, then with blue or violet, then yellow, and then green or red.—Eng. pat. No. 10,892, 1910; "B.J.," June 30, 1911, p. 500.

Multiple carbon tissue for producing multi-colour effects from ordinary negatives has been the subject of several patents in the past, notably that of Slavik, whose product was issued as "Multico" by the firm of Dr. Hezekiel, Berlin.—(See "B.J.," 1906, p. 66. Ed., "B.J.A.")

PHOTOGRAPHY IN COLOURS BY PRISMATIC DISPERSION.

This process, which entirely does away with the necessity of colour filters, is based upon the dispersion of the light rays from the image into spectra, which are produced juxtaposed upon the plate. The original idea was first patented by F. W. Lanchester in 1895 (see Patents Chronology, "B.J." Colour Supplement, April 5, 1907, p. 32). He describes a camera for making coloured photographs, in which the image is first thrown by a lens on to a condenser and grating ruled with opaque bars. The rays that pass through the slits of the grating enter another lens containing a prism, the axis of which is parallel to the bars of the grating. Each strip of light is split up into a spectrum by the prism, and the image thrown on the plate is made up of these parallel spectra. A similar apparatus reversed can be used as a magic lantern to project a coloured image on a screen from a transparency. In the "B.J.," January 4, 1904, p. 7, Julius Rheinberg, in ignorance of the above, also described a process for attaining the same end. Professor Lippmann in 1906 communicated to the Académie des Sciences ("B.J.," August 17, 1906, p. 644) a similar idea, which since then has been elaborated or utilised by several workers.

Gabriel Lippmann, in a paper before the Paris Academy of Sciences ("Comptes Rendus," July 30, 1906, p. 270), describes the application of the principle of the spectroscope to direct colour-photography. Instead of the single slit of a spectroscope, a series of slits all very close together is used. They are fine transparent lines of a ruled screen of five lines per mm., such as is employed in process work. This screen is fixed to the front of a photographic enlarger, i.e., to a box provided at its extremity with a sensitive plate, and carrying a converging lens at about the plane midway between its two ends. In front of the lens is fixed a prism of small angle, with its edge parallel to the transparent lines of the screen.

The image to be reproduced is projected on the screen, the sensitive plate is developed and put back in place. On illuminating the apparatus with white light an image is seen in colours. Each line of the screen acts as the slit of a spectroscope, and, as the lines are not visible at the distance of distinct vision, the image appears continuous.

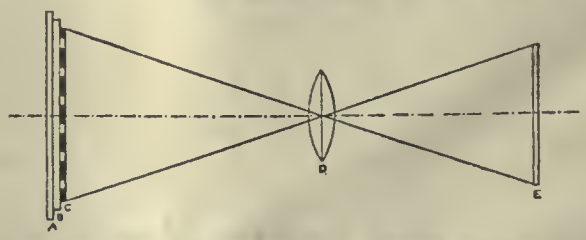
(*To be continued.*)

A Pioneer in Colour Photography!—A writer in "Photo Era," in the course of a review of colour processes mentions that in 1851 a clergyman named Hill, who lived in New York, startled the world by announcing that he had discovered a method of photographing in natural colours. Almost every newspaper and magazine in the country gave Hill column after column of free publicity because of his statement that, despite his being a poor man with a large family, he had refused offers of all kinds for his invention because he was determined that it should not be used as a monopoly by any one. A clipping taken from a paper published late in 1851, says: "Mr. Hill is pursuing a course which must sooner or later gain him the confidence of his fellow artists. It is Mr. Hill's intention to take out a patent covering his invention, yet he will act liberally towards his fellow-artists."

"Hill finally announced that, after much persuasion, he had been fully convinced that his duty to humanity demanded his publishing a book in which would be described his process. In accordance with this resolve, Hill printed a small leaflet in which was given the contents of the forthcoming volume. The price of the book was to be five dollars—first come, first served— with no favour shown to those of low or high degree. After collecting $15,000 in cold cash, Hill finally issued a cheaply-printed book on the daguerreotype-process. Thus he proved that, although he might have been a poor man, he was by no means a stupid one; and that, although he might not have discovered a way to make photography in colour, no one could deny that he had found an effective method to make fifteen thousand dollars."

Dust and the Paget Colour Process.—When doing some experimental work with the Paget colour process, which necessitated a journey over rather dusty roads for a couple of miles I had during the past summer a rather annoying experience. The taking screen and the panchromatic negative plate were very carefully knocked free from dust in the dark-room before being loaded into the slide—a double book form pattern to which I fitted an extra supplementary spring in order to secure perfect contact between plate and screen. I was surprised to find, however, upon developing my plates, that in two of the negatives the black "dots" instead of being very sharply defined as is essential for a good colour rendering were very diffused and in certain areas were absent altogether. The taking screen was not a new one, having been previously used with perfectly good results, but I was led to examine it with a view to tracing the cause of the trouble, especially as the making of a transparency and subsequent registration with a viewing screen confirmed my first suspicions that the taking screen and negative plate could not have been in perfect contact. Careful inspection of the taking screen proved that the trouble was caused by a number of minute particles of dust, which had worked in somehow, between the two surfaces and prevented proper contact and a proper representation of the "dots" in the negative. I afterwards overcame this trouble by making it a practice to bind the two glasses together lightly with strips of lantern slide linen, which ensured a more even contact and also absolutely prevented the entrance of dust The binding is easily removed by paring it round the edges with a sharp knife when it is desired to separate the plates. I have found that, however good may be the camera case, dark slides, etc., upon a dusty journey foreign bodies will find admittance somehow. In ordinary work such may do little harm beyond a few pinholes, but in colour work for the reason detailed above and also from the fact that owing to the impossibility of spotting them satisfactorily pin holes are to be avoided, some amount of preventive care against dust is an absolute necessity.—Expert

Wood Diffraction Process.—By an error last month the line diagram, Fig. 1, of the paragraph dealing with Mr. H. E. Ives's



improvements in the Wood diffraction process was incorrectly given. The drawing herewith reproduced is that which should have been Fig. 1.

No. 149. VOL. XII. APRIL 4, 1919.

13

THE BRITISH JOURNAL OF PHOTOGRAPHY

MONTHLY SUPPLEMENT

ON

Colour Photography.

CONTENTS.

PAGE
Two-Colour Cinematography 13
Three-Colour Bromoil Enlargements. From Negatives of the Joly Type 15

TWO-COLOUR CINEMATOGRAPHY.

The making of a cinematograph film in colours all ready for projection is an ideal which has been pursued by several experimenters, and is, we think, greatly advanced towards the commercial stage by a process just patented by Mr. Aron Hamburger, from whose specification, No. 123,786 of 1915, the following particulars are taken. Broadly, the process consists in simultaneous dye-toning of the two complementary colour-sensation monochrome images on the two sides of a band of film and in apparatus for carrying out this process.

The machine shown by way of example in figs. 1 and 2 is provided with means for carrying a double-printed bleached film *a* and passing it between a pair of suitably operated pressing rollers *b b'* by which the continuous bands *c c'* of porous absorbent material charged with the dyeing fluid and the film are fed.

The machine is also provided with guide or tension rollers *d d'*, and at a point beyond the pressing rollers *b b'* there are conveniently a pair of dye-fixing perforated rollers *e e'* emitting dry steam on the dye bands to fix the dye on such portion of the same as is required to be dyed, around which sets of rollers the continuous bands are in engagement. At points intermediate of the tension rollers and the pressing rollers suitable means are provided for keeping the absorbent bands *c c'* suitably saturated with the dyeing fluid.

The film and the dyeing bands are caused to pass slowly through the rolls, the rate being such as will permit of the dyeing being properly effected. The film is then washed off and fixed in the usual way.

In carrying the invention into effect in another form, instead of employing absorbent bands to carry the dyes, a series of frames is mounted in chain form round suitable spring-pressed polygonal rollers. These frames act in a similar manner to those described in the specification of Mr. Hamburger's application No 17882 of 1917, and are preferably closed shallow tanks, the closure of which is effected on the outside by glass plates, and on the inside by jointing material which seals them against the film, which one element of each pair of chains clamps between them.

In figs. 3 to 7, cast brass frames *g* carry brass frames *h*, securing rubber sealing strips *i* and glass plates *j* perforated to connect with inlet and outlet passages *k* for the dyeing fluids. The two halves of the cells are carried respectively around polygonal drums *l*, adjacent cells being connected by a plain link joint *m*, shown especially in fig. 5. The two halves forming a complete cell, one half being carried on one series of drums and the other on a second series, are registered by means of spigots or guiding pins *n* taking into holes, and the frames as a whole are positioned with respect to the drums by projections *p* on the latter

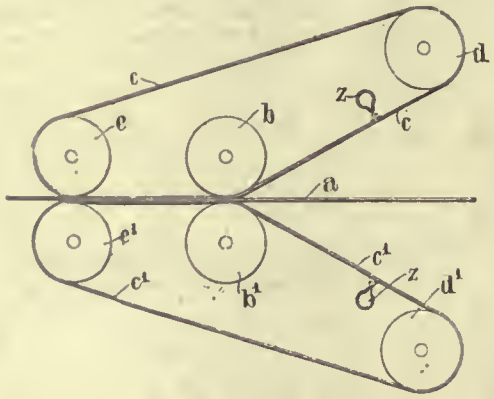


Fig. 1.

entering holes *o* on the former. The two halves of the frames are normally caused to approach by means of a spring indicated by *q*, and a simple linkage *r* can be provided for moving them to and fro. The dye may conveniently be fed from tanks *r'* disposed centrally between the chains of frames around the rollers, and means may conveniently be provided for raising or lowering these tanks; for instance, they can be mounted on standards *s* and held in the top position by swinging link *t*, which can be moved by hand so that the tanks can be lowered into the bottom position. They are raised to cause the flow of the fluid into the tank chambers, and lowered to withdraw the fluid therefrom; or, again, in another arrangement the fluids may be caused to circulate through jets, which play upon the film while it is clamped between the frames. When dyeing has been

effected, the chains are moved on one link, and the operations repeated on the next section of film. The film is also arranged to be fed on through washing, fixing, and drying appliances as usual.

In another method of carrying the invention into effect, the bleaching and pigmenting or dyeing are effected in one operation, by providing a bleaching bath, the composition of which is given below, in which strips of carbon paper or dye gelatine paper are caused to be soaked for a suitable time, say five minutes, on their passage to the two pairs of pressing rolls above described. The two papers and the film are allowed to remain in contact simultaneously with the film to be dyed a sufficient time, and are then fed forward into a position where the carbon paper is brought into contact with hot water for development, or, in the case of the dye paper, with cold water for washing. Simultaneous bleaching and pigmenting is thus effected.

Fig. 2.

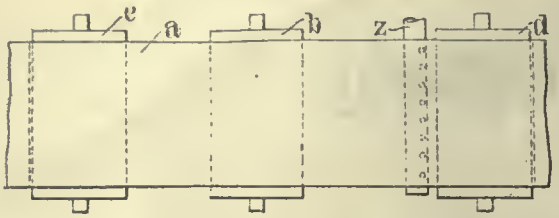


Fig. 3.

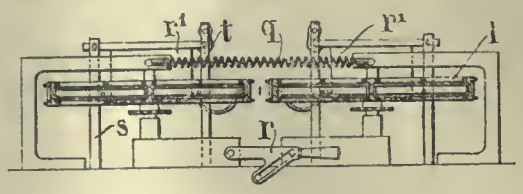


Fig.5.

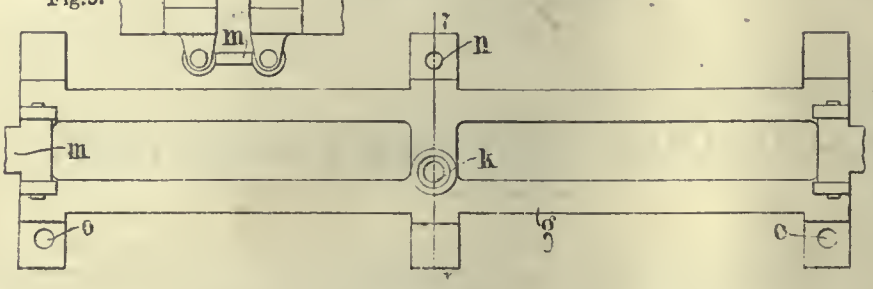


Fig. 6.

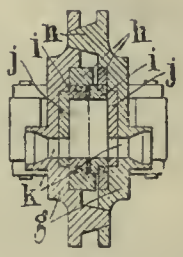


Fig. 7.

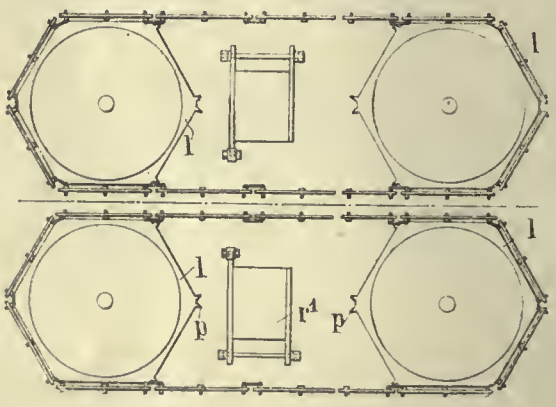


Fig. 4.

Mr. Hamburger finds that carbon and dye gelatine papers containing the desired colours when applied to a silver photograph image have, in addition to the property of bleaching the silver image, the property of impregnating the bleached image with the colour or pigment contained in them, that is to say, as the silver image is bleached by the solution it is at the same time absorbing pigment or pigmented gelatine from the band or plaster of carbon paper or dye gelatine paper, and by some action, perhaps catalytic, the amount of pigmented or coloured gelatine which is absorbed by the silver image during the coincident bleaching and pigmenting process becomes insoluble in water. Then, in the case of carbon paper, this is developed in hot water as usual, the paper floating away or being gently removed, and the resulting mass being treated with the warm water as in the usual carbon process, removing the soluble pigmented gelatine, and leaving the image in colour. In the case of dye gelatine papers cold water treatment is employed instead of treatment by warm water.

The required combined bleaching and pigmenting solution for use either with dye bands or carbon pigment paper is prepared from the following ingredients:—

Copper sulphate	4 ozs.
Potassium bromide	1400 grs.
Potassium bichromate	180 grs.
Hydrochloric acid	80 minims.

The copper sulphate is dissolved with the potassium bromide in 20 ozs. of water, and the potassium bichromate in another equal quantity of water, with the indicated hydrochloric acid added. The two solutions are then mixed slowly, while stirring well, and the resulting solution is ready for use. The dyes required are for greenish blue, basic methylene blue, which should be as nearly as possible minus red, and for magenta red, basic fuchsia red, which should be as nearly as possible minus green.

(To be continued.)

Paget Colour Process.—It may be said that too little attention is paid by the majority of workers to keeping the taking screens and lens filters in a satisfactory condition. The taking screens should, of course, be protected as much as possible from the action of strong light, which may have a detrimental effect upon their adjustment. I have more than once known of trouble arising from neglect of this precaution. The screens should not be handled more than is really necessary, as their surface is very easily damaged. When not in use they may be kept wrapped up in tissue paper in their original boxes. If, however, in course of time the screen gets dirty or soiled it may be cleaned with a tuft of fluffless cotton wool moistened with methylated spirit. With regard to the lens filter, if this is not sealed between glass great care must be taken not to touch the surface of the gelatine with the fingers, or it will be ruined. I have not found any trouble arising from undue action of strong light, but it is, no doubt, a wise precaution to keep the gelatine filter carefully away from influences that may have a detrimental effect upon it. It should, of course, be protected from dust or damp, as the latter in my experience, tends to alter its colour.

THREE-COLOUR BROMOIL ENLARGEMENTS FROM NEGATIVES OF THE JOLY TYPE.

[It is difficult to find descriptive titles for the particular combinations of processes which are employed by experimenters in colour photography. Mr. S. H. Williams, whose paper before the Royal Photographic Society we reprint below from the Society's Journal, makes a negative through a banded three-colour filter such as that first employed by Professor Joly. He places the negative in an enlarging lantern, and by means of a ruled screen consisting of bands twice the width of the alternating spaces, and the latter the same width as the bands in his negative, he projects upon successive pieces of bromide paper the sets of bands representing the red, green, and blue-violet colour-sensations. Processes of this kind have been employed by Brasseur and Powrie. The element of novelty in Mr. Williams's processes is the means adopted for identifying the bands corresponding with a given colour-sensation when making the enlargement. But quite apart from this contribution to the technics of colour photography, his paper is a very remarkable demonstration of what can be done by an ingenious practical worker, unprovided with instruments of precision, in the way of originating a colour-screen plate and the screen or key-plate necessary for carrying out the process outlined above. Although the fact is not emphasised by Mr. Williams, it is clear that the relative excellence of the results which he exhibited, as regards brilliancy and freedom from the linear structure of the original negative, arises from the spread of the image which is produced when enlarging each separate set of bands upon the bromide paper. Probably the spread is due partly to optical causes and partly to development phenomenon, but if it did not take place to a considerable extent it would be impossible, as is pointed out by Mr. J. C. Warburg in the discussion of the paper, to obtain the solidity of the blacks which was characteristic of the colour enlargements shown. The same phenomenon comes into play in the making of contact copies from an Autochrome on to an Autochrome plate and is the factor which renders practicable what on theoretical grounds would be a process resulting, in the case of printing a positive from a positive, in a very great degr dation of the colours by admixture with black.—Eds. "B.J."]

The ordinary way of attempting three-colour work consists in making three separate exposures on three separate plates with three separate colour filters—red, green, and blue. The main objection to this is the necessity for the three separate exposures, since, except under the very best lighting conditions, it practically limits the worker to still life, for portraits are almost out of the question when three plates have to be exposed in succession, and the same is true of landscapes which include clouds. To overcome this objection a great many people have spent time upon ingenious devices, the most elementary of which was the use of a camera with three lenses side by side, thus giving the three pictures at one exposure. Unfortunately, the viewpoint of the three lenses differed, and so did the pictures. A modification of that method was to use three parts of the same lens by means of mirrors. But even though one got three pictures from a single lens, this did not eliminate what is known as the stereoscopic effect. Other devices have been suggested from time to time, involving again the interposition of mirrors, but none of them are free from objection.

It occurred to me that a much simpler method of working, and one that would get the three-colour impression at a single exposure on a single plate, would be to use a three-colour filter. Two conditions in the use of such a screen are extremely important, first, that the three-colour screen must be of such a character as to enable us readily to make a separate print from the parts filtered by each of the three colours; and, secondly, that the colour elements shall be so finely divided as to give the effect of a continuous picture.

So far as I know, there is no three-colour screen on the market which fulfils these conditions, and therefore the first thing I had to do to test my ideas was to make my own colour filters, and thereby hangs a story, which I may tell at a later stage. A screen was eventually evolved. The three colours of which it is composed are red, green, and blue, and they are arranged right across the plate in straight lines, the colours alternating. It is clear, I think, that if we were to expose a suitable plate behind such a screen, one-third of the plate—that is to say, the finely-divided parts which come behind the red lines—will be filtered by the red, another third by the green, and the final third by the blue. If we can readily make a print from the parts which come behind each set of lines, and the lines are sufficiently fine to give the effect of a continuous picture, then we shall be able to get the equivalent of the three-colour impressions either in black and white or in colours complementary to the colours on the screen, that a worker of the ordinary method gets from his three separate negatives.

In order to carry this out it is necessary to have another screen, which consists simply of black lines and clear spaces. The black lines are the same number to the inch as the lines of each colour in the colour screen, namely, 180 to the inch, or, in the case of the colour screen, 540 lines of the three colours. But the black lines in this other screen are just twice the width of the spaces in between, or equal to the width of two contiguous lines of different colours in the colour screen. I have here models of both the colour screen and of the key-plate, as the other is called, and it will be observed that if I put the key-plate in contact with the colour screen a number of coloured bands appear, due to the colour lines of the screen being crossed by the lines of the key-plate, and the bands can be made wider or narrower as the screen is turned. Ultimately, in a certain position, when the lines of the key-plate are parallel to the lines of the screen, the colour bands disappear altogether. By now sliding the key-plate a little, I can cover up any two colours and expose the other, so that I can get in turn a red, green, or blue impression.

Now, in the case of the negative which has been exposed behind the colour screen, the key-plate makes it possible to cover up, not two colours, but those parts of the plate which have been filtered by those two colours, and to make a print from the exposed portion. I can slide the key-plate along the negative, first exposing from the parts filtered by the green, then, after a slight motion, from the parts filtered by the red, and, finally, from the parts filtered by the blue. That is an operation which can be done by hand, but I have designed and constructed a mechanical way of doing it which reduces the operation to as automatic a movement as most of the operations in photography. I have here a carrier for my enlarging camera with two platforms, on one of which I place the negative, which is held in position by a number of little springs bearing on the edges of the plate, and on the other platform I put the key-plate. On closing up the carrier the two are brought into contact, and I have introduced, by very simple link motions actuated by screws, means of turning and of sliding the one plate in relation to the other.

In operation, therefore, we have first of all the three-colour filter behind which we expose a plate. The negative is mounted on one of these platforms, the key-plate on the other, the apparatus closed up, and the negative and key-plate are brought

into contact. The carrier is put in the enlarger. On looking at the enlarging easel we see a projection of the negative crossed by a number of bands. These are the equivalent of the colour bands seen earlier, and are formed by the lines on the key-plate crossing the lines on the negative. It remains to turn the screw until the bands widen out and ultimately disappear, when one knows that one set of lines is parallel with the other, and then by turning the other screw the key-plate can be moved until it covers up the parts of the negative filtered by two colours, and now I can make an exposure from the parts filtered by the third colour. By moving the key-plate along I get in turn prints from the parts filtered from each of the other colours.

It may be asked how I know which parts I am covering up. We have an easy way of arriving at that information. On the colour screen I have certain marks which I call identification marks. A single mark consists of a break in the blue lines, a double mark of a break in the green lines, and a treble mark of a break in the red. When I am covering up on the colour screen the parts coloured green and red, and only the blue lines are to be seen, I see that single mark because it consists only of breaks in the blue lines. On sliding the key-plate along I become aware of the double lines which consist of the breaks in the green, and on displacing further these disappear, and I see the three marks. These same identification marks are on the negative, only instead of being white marks they are darker. Therefore, on sliding the key-plate across the negative, I know when I see the single mark that I have the parts of the negative which have been filtered by blue; similarly when the double mark is visible we have parts of the negative filtered by green, and similarly again the treble mark indicates the parts filtered by red.

Thus I have from the one singly-exposed negative three separate prints, one of which has been filtered by red, one by green, and the other by blue. From this stage it is possible to work in any one of a dozen different ways. The ozobrome method can be used, as is done in the Raydex printing process, or, instead of using the colour sheets of the Raydex method we can get, still by the ozobrome process, three pictures in plain gelatine, which can be dyed up, and we have what is known as the Sanger-Shepherd process. Or these three prints can be treated as the printing positives of the pinatype method; or again—particularly if we use a paper like the Kodak transferotype—the prints can be bleached to a silver salt which has an affinity for certain dyes, such as silver iodide has, and the prints can be dyed up in three colours complementary to those of the screen, the silver being removed ultimately and the three prints put in register so as to give the colour result.

The method which appeals to me most, however, is the Bromoil method, and the few pictures I have to show are obtained by that method. The yellow, red, and blue prints, complementary to the blue, green, and red of the screen, are bleached for Bromoil, and after they have gone through the usual bleaching processes, they are inked up in printer's ink applied with a brush. My own method of working is something like this: Having bleached these three prints, which are soaking in water, I take out the yellow one, make it surface-dry by mopping, and then by means of a brush ink it up in yellow; when completed I put it on a piece of plain drawing paper, smooth it out, and subject it to pressure (in my own case it is put through the domestic mangle). I have thus transferred the yellow pigment from my bromide on to the drawing paper. The paper bearing the yellow print is now hung up to dry; it is not very wet, but it has absorbed a little of the water from the wet print. I then proceed to pigment up the second print; it is surface-dried, inked-up blue, and then put on the top of the yellow print in register and passed through the mangle—which means that I have transferred the blue on to the top of the yellow. To complete it, I go through the same process with the third print, inked up red, put it on the top of the print which already bears two impressions, and again put it through the mangle. It is not a long process, occupying, with prints the size I show (about half-plate size), perhaps half an hour.

Mr. Williams then showed a number of results, which were passed round. They included the representation of a colour chart, landscapes, fruit studies, a sunset, landscapes with figures, and a portrait. In some cases on looking closely it was possible to see the lines, but the lecturer said that he could have eliminated them if he had cared to do so. He had one landscape enlarged about three and three-quarter times, and by putting it a little out of focus he eliminated the lines completely. But even though one focussed sharply, the lines were not visible on ordinary viewing, as, for example, at a distance of three or four feet from an exhibition wall.

A large number of questions were then put to Mr. Williams. Asked what increase of exposure was necessary, using the screen, he said that the combination was slightly handicapped in the blue—the panchromatic plate, while much more sensitive to the red than the ordinary plate, was still more sensitive to blue than to red, and therefore blue was handicapped with a slightly orange filter—but he worked the combination, using the three-colour screen in position at *f*/16 (using the language of Wynne's exposure meter), or about one-eighth of the actinometer time as given by Wynne's meter on an ordinary subject at *f*/7. Asked further how many times the usual exposure that would be, he said that as nearly as he could judge on a rough calculation, he should say about twenty-four times. In reply to further questions, he said that the negative plate he used was a Paget colour plate. He used the Paget colour plate and worked it at *f*/16 Wynne.

Obviously the three prints had to be made through the lantern, because he had got to cover two-thirds of the negative each time. One member suggested that the carbon process was necessarily excluded, but Mr. Williams claimed that his methods of working did not exclude any process. When the three prints had been made on paper they could be reversed. Having printed the positive, one could remove it with potassium permanganate and sulphuric acid and develop the remaining parts of the silver. Thus one could have negatives in place of positives, and by working from these, use the carbon process or any similar process that was desired.

Asked what particular method he adopted for registration when superimposing colours, Mr. Williams said that in the registration of the prints he had tried half-a-dozen ways, all of which could be worked, but the easiest was to mark on the back of the negative, somewhere near the margins of the part of the negative he was going to use, a cross at each margin. These would show in the prints as white crosses, and being on the same negative, would be in the same position in each of the three prints. Then he could cut away the prints up to the line and use these as a means of register when transferring his prints. He did not claim that this or any such method would give microscopic register, but it was near enough for practical purposes. His earlier prints were made on ordinary dried drawing-paper. He had never damped it. But on looking at some of the earlier prints it would be apparent that there was a feature about them not altogether pleasing; they appeared rather dead. There was an opacity in the shadows he did not like. This led him to attempt to treat his paper, but he had not yet reached the final stage in his experiments along this line. At present he was treating it with a mixture of celluloid solution and oil containing a white pigment. He put it on with the brush, and he found it overcome that objectionable deadness; also the paper absorbed moisture nothing like so readily from the print. He promised to send the society particulars of his experiments when completed.

(*To be continued.*)

No. 150. VOL. XII. MAY 2, 1919.

THE BRITISH JOURNAL OF PHOTOGRAPHY

MONTHLY SUPPLEMENT

ON

Colour Photography.

17

CONTENTS.

	PAGE
Two-Colour Cinematography	17
Three-Colour Bromoil Enlargements from Negatives of the Joly Type	18
Decennia Practica—Colour Photography:— Photography in Colours by Prismatic Dispersion	20

TWO-COLOUR CINEMATOGRAPHY.

[In the patent specification from which we quote in the following article details are given supplementary to those published a month ago of the processes lately invented by Mr. Aron Hamburger for the production of ready-to-show colour cinematograph film. It will be seen that Mr. Hamburger's invention consists in a process and apparatus for simultaneously printing a colour impression on both sides of a cinematograph film. Although described in the specification as for two-colour it can be understood that the process is equally applicable to the making of a three-colour film.—Eds. "B.J. Colour Photography" Supplement.]

Further details of the manner of carrying out a two-colour process of the kind already described are given in a further specification, No. 123,787, also of 1917, in which details are given not in specific reference to colour cinematography, though evidently they are applicable thereto.

According to this specification, complementary colour negatives (e.g., a red or orange-red value negative and a blue or blue-green value negative), one of which is reversed, are accurately super-imposed on opposite sides of a double sensitised film and photo-chemically printed, and the combined positive produced is coloured on each side practically simultaneously (after bleaching or in a manner combining bleaching and colouring), and preferably combined with a yellow-value positive, prepared preferably by the process of Patent No. 20880 of 1911. The invention also consists in a special dyeing frame for use in connection with such process.

In carrying this invention into effect in one form a red-value negative and blue-value negative are made of the coloured object to be reproduced by photographing through colour screens by means of a camera in the usual way. If these negatives are prepared with an ordinary camera, one of the negatives is reversed. Mr. Hamburger prefers, however, to employ a camera embodying the invention described in Patent No. 28,722 of 1912, in which case he obtains both negatives at the same time, one of them being reversed. These negatives represent the red value of the object and the blue value of the object respectively, and should be practically complementary. They are accurately superimposed in relation to one another upon opposite sides of a doubly-sensitised film, i.e., a film having emulsion on both sides. Each of these negatives is then printed by suitable simultaneous illumination from opposite sides and developed and fixed as usual. When the negatives are truly complementary and of practically the same density, it is found that no protective screening is required if equal illuminations be used, and that the colour values print without interference with one another. The double positive is then bleached, say by the well-known Traube method. The object of this process is to convert the silver image into a silver salt, which has a high affinity for coal-tar colours. In order to obtain an image more stable and resistant to washing, etc., Mr. Hamburger prefers to employ a bleaching solution made up as follows:—2 fluid ozs. of a solution of 1 oz. of potassium iodide in 9 ozs. of water are added slowly, and with stirring, to 4 fluid ozs. of a solution of 1 oz. of potassium bichromate and 9 ozs. of water. To the resulting solution is added very slowly, and with stirring, 16 fluid ozs. of water containing 80 minims hydrochloric acid. The developed and fixed film which is to be coloured is soaked in cold water and allowed to drain. It is then introduced into the bleaching bath, until the silver in the image is completely bleached. It is then thoroughly washed in cold water, and then in warm water up to 140 degs. F., until all reddish and yellowish stains disappear, and the non-silver spaces are thoroughly colourless and clear. The positive is then ready for dyeing. The positive thus produced is then placed in a dyeing frame, as shown in the drawings.

Two rectangular frames *a a'* of a suitable size for the positive film to be treated are constructed similar to printing frames, but the one is adapted to fit into the rebate of the other, just as if it were the glass of an ordinary printing frame. The rebate of the one frame is provided with rubber *b* or like jointing material, so that the film *c* when pressed against it round the edges will be sealed with a water-tight joint. The second half of the frame is also provided with a ring of jointing material *b'*, and is placed on the top of the film, clamping the latter against the other half-frame all round its edges in a water-tight manner. The outer side of each of the halves of the frame is provided with a sheet of glass *d d'* sealing against the edges of the frames, and thus forming a tank chamber on each side of the film. The two halves of the frame may be arranged for rapid opening and closing by means of hinges *e* along the bottom edge and wing nuts and screws *f* on the top edge. The tank chambers on each side of the film are provided with outlet passages *g* at

their lower ends, and these are controlled by suitable cocks or valves *h*. Inlets *i i'* are provided at the top edges of the tank chambers, for the admission of the dyeing fluids. Means are also provided for the outlet of air by the valves *k k'* as the fluid

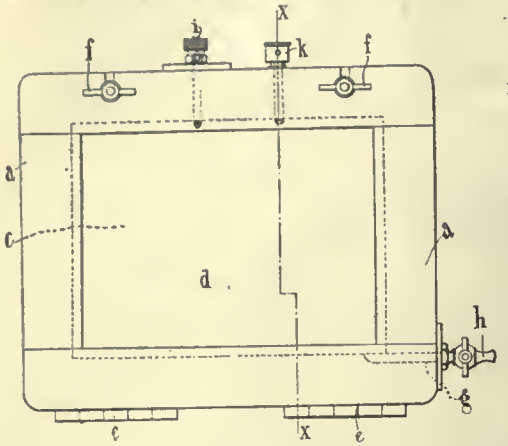


Fig. 1.

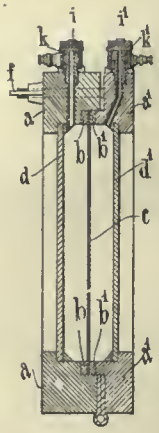


Fig. 2.

is introduced. The air exit valves *k k'* may be adapted to be closed at will. To allow for the sagging of the film, in case one fluid should be introduced slightly before the other (the dyeing still being substantially simultaneous), the inlet passages may each be provided with a small reservoir not shown, which will hold fluid displaced from the tank chambers.

The film introduced into the dyeing tank just described, and clamped therein, is dyed by the introduction of the appropriate dyeing fluids on each side. The film may thus be simultaneously dyed on both sides. The dyeing fluids are then run off, and the positive thoroughly washed, until all the non-silver parts are cleared of dye. Fixing is then effected in hyposulphite of soda, containing 5 per cent. of tannic acid, and the film is then washed and dried in the ordinary way.

The positive film thus obtained is then combined by superposition with a yellow-tone positive representing the yellow-colour value of the object photographed. Where a two-colour result only is desired, a positive similarly made from orange-red and blue-green value negatives and dyed relatively blue-green and orange-red, may be mounted on paper or used as a transparency. The yellow positive is preferably obtained by the process described in the Patent No. 20880 of 1911, and the combination gives a practically perfect colour reproduction of the original object in natural colours.

In carrying this invention into effect in another form, instead of separately bleaching and dyeing the positive images printed on the film from complementary colour negatives, both bleaching and pigmenting or dyeing may be done simultaneously by taking carbon papers or dye gelatine papers containing the desired colours and soaking them for five minutes in a bleaching solution according to the method already described in Patent No. 123-786. (" Colour Photography " Supplement, April 4, 1919.)

THREE-COLOUR BROMOIL ENLARGEMENTS FROM NEGATIVES OF THE JOLY TYPE.

[The concluding portion of the paper read before the Royal Photographic Society by Mr. S. H. Williams contains the latter's replies to questions which were asked, but for the most part deals with the extremely ingenious methods devised and employed by Mr. Williams for the making of the original three-colour banded filter with which his negatives were made. Everybody who knows anything of colour photography understands the nature of the Joly colour-filter, but few perhaps have taken the trouble to make one for themselves by methods which, as will be seen, are within the competency of a worker possessed of plenty of patience and something more than the average ingenuity in the use of tools.—Eds. "B. J. Colour Photography " Supplement.]

Another question was asked as to whether it mattered in what order the pigments were put on. Mr. Williams said that it was usual to put the yellow on first because, of the three colours, the yellow was the most opaque. But so far as his experience went it did not matter very much in the ordinary way which colour was put on first. The order generally followed was yellow, blue, and red. As to whether there was any difficulty in getting the right shades of colour, he said that here arose one of the advantages of the Bromoil method. But as it only took about half an hour's work at the sizes shown (about half-plate size) to make a complete print, and if that print was not what the worker wanted, he could make a second one, and profit from the lessons of the first. If the first print was deficient or excessive in any particular colour, he had only to modify his method accordingly the next time. There was probably more difficulty in getting uniform results by the Bromoil method than by any other.

On a member raising a question as to additive processes, Mr. Williams said that additive methods did not come into consideration at all. Two methods were in vogue for combining colours, one the additive method in which the primary colours were red, green, and blue, and yellow was a secondary, obtained by mixing green and red, but his method, like most methods on paper, was a subtractive method, and the three primary colours were the painter's primaries, namely, red, yellow, and blue. Additive considerations, therefore, did not interest him at all in this method. So long as his three-colour elements in the colour filter were efficient, he need not bother about the production of a correct additive result. He was not concerned with transparencies, although he had made them, and had intended to bring some results to that meeting. When he talked about registration, he simply meant registration for the subject and not for the lines. That the method was on a right basis he could only argue from the general success of the examples shown. In some cases, on looking closely, the lines of the negative might be seen, but in others they would be entirely absent, because he had taken special precautions to blur them. The reason for the difference in colour of the two prints from the same negative, to which a member drew attention, was that, as usual, he had been experimenting. In one case he might have given the three prints absolutely the same exposure, while in the second set he gave the red a little longer, which meant that he had a red note predominant all through the picture. He had worked with screens varying from 150 to 250 lines of each colour to the inch, but there was a special reason why he had ultimately fixed on 180 lines, which he would explain presently, if he had opportunity to describe the making of the screen. The prints he had brought forward were absolutely straight prints.

A member raised the question as to whether it was possible to produce blacks, or, indeed, to reproduce a given chart correctly; and another member (Mr. Warburg) said that if the image were not blurred a black could not possibly be obtained. In order to get a black, each of the lines, said Mr. Warburg, must be blurred to three times its original space; the blur seemed to be essential to this method of work. Mr. Williams said, in reply, that he did not claim for a moment that the

Bromoil method, at any rate, would give every colour with absolute correctness. The inking-up was so largely a personal matter that he would not guarantee it in any instance. Even the painter had to compromise. It was not possible to put on paper in black and white alone, to say nothing of colour, the range of tones between the darkest shadow and the highest light. They had to compromise. But as to the production of black, he thought that black could be reproduced nearly enough for pictorial purposes, because in outside work black never entered. A sufficient depth of colour could be got, by either the Ozobrome or Bromoil method that approximated to black for all pictorial purposes. As to the point raised about the three lines not giving a black by reason of their not covering up the space, if the member tried this method he would find when he examined his prints that in the darks the light-action had spread over beyond the lines; in fact, in the very darkest parts of the picture the lines would be absolutely lost. That was what happened in the very dark portions of the picture—the lines widening out until in most cases they joined up together and gave in the very dark an almost uniform black, and hence a continuous picture in the darks.

Mr. Williams then described his experiments in making the three-colour line screens. He said that for the making of the colour screens another key-plate was necessary, only, instead of being a key-plate like the one he had shown, with black lines twice the width of the space, it was the reverse, i.e., the black lines were half the width of the clear space. He was told that screens could be purchased, but on applying to a firm who had made screens for process blocks, he was informed that while such a screen could be made for him, it would be necessary to send over to America, and they could not be promised for at least nine weeks. Thereupon he decided to make his own screen. To rule it with a diamond point was out of the question, and he proceeded to try another method of ruling. The first thing he did was to take two pieces of printer's brass, mounted on two strips of plate glass to keep them flat, and he spent some hours grinding the edges. This gave him the means of getting a slit of light, by mounting the brasses on the parallel ruler principle. He then described his arrangement for exposing through the slit and moving the plate along as required. He had two laths about six feet long, to the bottom of which was attached the board carrying the photographic plate. He attached a screw to this board, and at the other end of it he had a weight passing over a small pulley. By means of the screw he was able to shift the plate by almost infinitely small distances. The number of threads per inch in the screw was fifty. A complete turn of the nut of the screw would therefore move the plate by one-fiftieth of an inch. The nut had four notches in the fashion of a ratchet-wheel, and therefore to move it one-quarter of a turn as guided by one of these ratchets would shift the plate one-two-hundredth of an inch. This arrangement he yoked up with his enlarging apparatus. On giving an exposure through the slit, a line was traced on the photographic plate, and on moving the screw a quarter of a turn, and giving a second exposure, a second line was traced one-two-hundredth of an inch distant, another movement and a third line was in position, and so on right across the plate. He could go all the way across a quarter-plate in twenty-five minutes at 200 lines to the inch.

His first screen thus constructed was rather like a Scotch plaid. It was marked by bands both vertically and horizontally. The one set of bands he could understand, for they were due to the lines not being exactly straight, and by dint of hard work he got rid of these ultimately. But the bands in the other direction were a more difficult problem. He could not think what caused them, until at last he came to the conclusion that they must be due to the fault of the shutter not always working at the same speed, and therefore the exposures were not quite uniform across the plate. He thereupon set to work to invent another shutter, and he made a focal-plane shutter on a pendulum with a piece of cardboard at the bottom sufficiently big to cover the slit when hanging at rest, but sufficiently far out of the centre to ensure that when the pendulum was swung, it swung past the slit. This device enabled him to give absolutely the same exposure every time. Shutters not only varied from the speeds given by their makers, but they did not always work at the same speed. The shutter he improvised, however, did so. But it did not get rid of the bands! It made a big improvement, but the bands remained.

By careful watching he then discovered that the gas supply he was using was inconstant in its pressure. Having as neighbours both a gas manager and an electrical engineer, he called them into consultation. The gas manager provided him with half-a-dozen kinds of gas governors, but however well they served their proper purpose, they did not answer in this emergency. The electrical engineer brought him an assortment of batteries and so forth, by which he claimed that a constant light could be secured. He put the plate on, ruled half-way across it, then interrupted the work, switching off the light, and completing it again after an interval. In the result there were no bands—except one! What had happened was that during the process the battery had weakened, so that the lines on the plate had grown slowly and imperceptibly fainter, but when he stopped and gave the battery a rest, it recovered, and the lines began again at the original strength or thereabouts, so that the break was noticeable. Therefore this was another uncertain light source. He could, of course, have eliminated the band if he had gone right across the plate at one sitting, but the lines in that event would have been thicker on one side than on the other.

Ultimately he got over the difficulty. He got out a cocoa tin, through the bottom of it put two tubes, one of which he connected up by an indiarubber tube to his enlarger, and the other he connected up with the gas supply. In this was placed a smaller cylinder, inverted, and having weighted it with a strip of lead at the bottom, he put some water in the larger vessel, and so adjusted matters that the weight of the smaller tin determined the pressure of gas that he was using. If he got his gas at too high a pressure the gas would bubble out at the bottom. To the tap controlling the supply of gas he arranged a quadrant, and then by means of a very flexible cord and a little pulley he connected it with the floating cylinder. As this cylinder tended to rise, the weight of the sector brought it down and automatically closed the tap, that is to say, the width of the tap was regulated by the height of the cylinder, and the weight of the cylinder determined the pressure of gas supplied. The constancy of gas supply with this arrangement was such that he could make a test for a trial strip on one day and expose it on the next, because he knew that when he turned on the tap he got a constant light.

In this way he had ruled screens up to 250 lines to the inch, but the number of lines was limited to a large extent by a thing he could not control, namely, the waviness of the glass. He had come to the conclusion that 180 lines to the inch of each colour would be sufficient. He found out later that there was a firm in England who made these screens. F. E. Brown and Co., of Leicester, undertook to make him one specially for 25s., and when it was remembered that these screens had to be ruled with a diamond point and etched so as to be deeper still and then filled in with pigment, the charge could not be called excessive. In the first that arrived, the relative widths of lines and spaces were not absolutely correct, and the firm made him another, which was smashed in the post, and then they made him a third, which gave a good result. Nevertheless, he did not regret his experiments along the same line.

From this point the making of a colour filter was comparatively easy. The first thing to do was to coat a piece of glass with celluloid, and then to coat it thinly with bichromated glue.

In order to get a thin enough coating he used a whirler. The bichromated glue was poured on then with a glass rod, leaning just on the edge, the glue was spread all over the plate, it was whirled round so as to leave nothing but an excessively thin film, the remainder being thrown off into the sink below. It was whirled until it was dry, and the next thing was to expose it to light under the printed key-plate. On this gummy coating, the parts which came behind the clear spaces, being subject to light action, became insoluble, and the parts behind the black lines still remained soluble. Then it was put into water and these insoluble lines washed off. All that remained to be done then was to put it into a spirit solution of dye, and in the parts where it was not protected by the gum it took the dye, and where the gum covered it, it did not take the dye. In this way a set of lines was obtained in one colour, covering one-third of the plate. The insoluble glue was sponged off. After coating again with glue a print was taken a second time, only not quite in the same position—it was moved the width of a line, which was 1/540th of an inch. This second printing, therefore, was made 1/540th of an inch from the first, developed in the same way, and put into the second solution of dye, which gives a second set of lines, in a second colour, side by side with the first set. We have now two-thirds of the plate dyed in two colours and one-third still to be dyed. Again sponging off the insoluble glue lines, again coating all over with glue and a third printing, etc., gives the complete filter.

DECENNIA PRACTICA—COLOUR PHOTOGRAPHY.

Under this heading we apply to the various branches of colour photography the processes of collection and arrangement accorded to some fifty departments of ordinary photography in the "B. J." during 1916. These extracts are from issues of the "British Journal Almanac" of the years 1906 to 1915, and the present series of epitomes thus resuscitates and brings together in compact form much useful information, otherwise scattered through nearly a dozen volumes.—EDS. "Colour Photography" Supplement.

PHOTOGRAPHY IN COLOURS BY PRISMATIC DISPERSION.

(*Continued from page* 12.)

It is necessary that the prism fixed in the apparatus shall have an angle so small that each spectrum has a length less than the interlinear space, otherwise the spectra encroach on each other. It is also essential that the photographic plate occupies exactly the same position as during exposure, a condition which is easily fulfilled in the case of solidly constructed apparatus. If the positive is moved in its frame, the colours rapidly change; if it is turned, there is a coloured moirée effect. On bringing the plate back to its original position these effects disappear.

Rapid commercial orthochromatic plates may be used, and the exposure is much shorter than in the interference process.

It will perhaps be possible to improve this process so as to avoid the use of an apparatus to observe the colours, and to make the plate sufficient in itself.

Suppose that a sensitive plate be placed in an ordinary camera, without a prism, but with the interposition of a ruled screen, and suppose that on the screen (which, we will say, has 5 lines per mm.) we superpose a grating of 500 lines per mm.; each luminous point thus projected on to the screen then spreads as a spectrum, and is photographed. On applying the screen, with its grating, to the developed positive, we should see the colours of the original—that is to say, if the eye can occupy the place of the lens.—"B.J.," Aug. 17, 1906, p. 644.

M. André Cheron describes his arrangement as follows:—Using a screen with an opaque line of 1/5 mm. broad, two cameras, as

T, screen; V, micrometer screw; P, prism; S, cliché; L, magnifying glass.

shown in the diagram, are combined—the first intended to form on the screen, by means of the first lens, the image of the object; the second intended to re-take this image in lines by a second lens (in front or behind which is the prism), and to project it on a photographic plate in a series of spectra side by side. The lines of the screen are very close together; the angle of the prism is much reduced (2 degrees 30 minutes). Focussing is effected by means of a micrometer screw, which shifts the screen minute distances to the right or left. Two magnifying glasses are employed and are absolutely necessary, the one behind the screen to make the rays converge towards the second lens, the other behind the second lens to converge the rays striking the positive to the observer's eye.—"Phot. Couleurs," Nov., 1906, p. 89; "B.J.," Nov. 16, 1906, p. 904.

André Cheron has further improved the apparatus for the prismatic dispersion process (see "B.J.A.," 1908, p. 714). The unequal sharpness of the spectra over the whole surface of the image in consequence of the different angle of the rays falling on the prism is remedied by increasing the focal length of the second lens so as to reduce the angle at the edge of the plate. The apparatus, however, measures 43 ins. in length, although less than 4½ ins. each way. For convenience of carrying it is made in three sections, each about 14 ins. in length, and hinged so that one section folds over another to the total dimensions of about 14 ins. long, 13 ins. high, and 6 ins. thick.

Connected to the first section by a bellows is the board for the first lens, at the focus of which are placed the first single lens and the screen. The whole is mounted on a board which can be moved backwards or forwards from the outside of the apparatus by a rack

O, O', lenses; M, single lenses; T, screen; C, C', C'', rack and pinions; R, R', hinges; P, prism; Pl, plate; L, L', micrometric screws; V, eye-hole.

and pinion. The middle section contains the second lens (long focus), also mounted on a movable panel.—"Phot. Couleurs," Nov., 1907, p. 161; "B.J." Colour Supplement, Jan. 3, 1908, p. 3.

A further patent for the prismatic process is that of F. Urban (Eng. Pat. No. 8,723, 1907.—"B.J.," Nov. 15, 1907, p. 869).

(To be continued.)

PRIZMA COLOUR CINEMATOGRAPHY.—The proprietors of this process, Messrs. Prizma Inc., 11, East Fourteenth Street, New York, write as follows:—In the issue of the "British Journal" of February 1, 1918, our late friend, Alfred S. Cory, unintentionally gave you some notes re the Prizma motion picture films which are not correctly stated. Prizma has since December 28, 1918, been releasing films of the kind described in the last paragraph of the article to which we refer above. We have not given out any detailed description as to our method of working, nor are we ready at this writing to do so, not because of patent reasons, but because certain changes will be incorporated in the films shortly. Our plant has only a limited capacity; we cannot supply the demands of the American market this year, so that it is not likely that films will go abroad for some time. So far as our technical methods are concerned, we prefer only to say:—(1) Negatives made in two complementary pairs as per our English patent. We have never taken any two-colour negatives. (2) Positives have two superimposed records on each area, one set that of the orange and red records coloured with a single uniform colour, and the same applies to the green-blues The films project at the customary speed on any standard projector. No attachments of any kind. These positives have been showing for twelve weeks at the Rivoli Theatre in New York City and in nearly 100 cities of the United States since December 28. Ten subjects have been released to date.

No. 151. VOL. XII. JUNE 6, 1919.

THE BRITISH JOURNAL OF PHOTOGRAPHY

MONTHLY SUPPLEMENT

ON

Colour Photography.

CONTENTS.

Where we Stand in Colour Photography 21
The Light Filter in Autochrome Photography. By Bertram E. Haveland 22
A Combined Transparency Viewing Apparatus and Retouching Stand 23
Notes on the Paget Process 24
Books on Colour Photography 24

WHERE WE STAND IN COLOUR PHOTOGRAPHY.

The circumstances of the past four and a half years have necessarily been very unfavourable to progress in arts such as that of colour photography, and therefore there may be many readers of these lines in distant parts of the world for whom, at the present time, the so-called "colour plates," producing colour transparencies, stand for what they understand by "colour photography." But these screen-plates, the Autochrome and the Paget, admirable as they are, represent only a special form of a colour photographic process, though certainly for the purposes of the ordinary photographer they are the chief materials for the making of photographs in natural colours. Hence some review of what has been done and of what may be done along other lines may be of interest to many whose acquaintance with colour processes is of comparatively recent date.

There is no need on this occasion to go back as far in the history of colour photography as the processes chiefly due to the inventive and mechanical genius of Mr. F. E. Ives, now of New York, except to say that the optical colour effects which were produced by his Kromskop and lantern Kromskop were probably as perfect renderings of colour as have ever been produced. Yet beautiful as they were, public taste naturally asks for something more tangible than an image upon a lantern-screen or the optical assemblage of three separate images in a viewing apparatus. The public wants, or thinks it wants, prints in colour, and still nurses a qualified dissatisfaction that the results by the Autochrome and Paget processes are obtainable only as glass transparencies. Here, perhaps, a word may be said on the purely human element in the case. We need to distinguish, in forming an estimate of the value of any process of colour photography claiming to yield paper prints, between the requirements of the purely amateur photographer and of the people who would use such a method for commercial purposes such as portraiture, etc. The amateur undoubtedly would welcome with delight a colour process, even one with imperfections if it involved no more delicate manipulation than that necessary in ordinary black and white photography. In the case of the professional maker of portraits, it is to be considered that at present he has at his command processes of colouring which in many cases are not expensive and which, moreover, possess the very greatest latitude, enabling him to produce results beyond the powers of a hard and fast colour process and for commercial purposes more useful. In judging the results by any new colour process the judgment must be entirely on their merits, and after elimination of any kudos attaching to them from the fact that they are made by purely photographic methods instead of by the skill of a colourist. One could perhaps sell colour photographs for a little while as curiosities, but the experiment has been tried, with the result that the public was found to judge always by results and was not particularly concerned as to how they are got.

When we review the methods which have been used for making actual colour photographs on paper by the so-called subtractive processes, we see that a method capable of being reduced much more fully to a working system is necessary before any such process is likely to come into general use either by the professional or the amateur. No doubt many readers of this article have heard of colour prints by the Sanger-Shepherd process, though few no doubt, unless they have worked the process for themselves, have seen any. A process capable of very fine results, but calling for a degree of care and observance of detail beyond the inclination of the amateur in these hurried days and commercially too elaborate for the professional. Very much the same may be said of the making of three-colour prints by the carbon process which also, in expert hands, has yielded altogether beautiful results. In the form of the Raydex process, in which pigmentation is done according to the Ozobrome method, three-colour carbon printing has obtained a measure of simplification, one element in which is that the printing is done in the first instance on bromide paper and does not require daylight at any stage. When we have mentioned these three processes, we have perhaps singled out those which yield beautiful three-colour prints from the sets of colour-sensation negatives, but which nevertheless are processes for the few. We should hardly be inclined to include Pinatype among them for the reason that the best three-colour prints by this process which we ever saw had a "dye-y" look. The process for the purposes of three-colour printing may, at any rate, be said to be dead, if it was ever really alive.

On the other hand, within the past few years progress has been made in giving a greater facility to these methods in which three-colour images are assembled in register to form the print in natural colours. Mr. Ives has done much in removing difficulties of manipulation by his invention of the Hichrome process, the development of which has no doubt been hindered by

lock the transparency in position. The groove of the carrier also avoids damage to the binding of the transparency and keeps the surface of an unprotected negative or positive clear of any other part of the apparatus which could damage it.

In Fig. 3 is shown the position of the apparatus when used as an illuminating device for making lantern-slides by reduction and similar work. The several parts of the apparatus fold compactly together, and are contained in a cabinet, which is also fitted with a drawer made to hold rigidly any number of transparencies up to 112. Space is provided for carriers, and the whole outfit, although no more bulky than the average microscope case, furnishes the colour photographer with the means of looking at his results under the most favourable conditions and of taking them conveniently to the

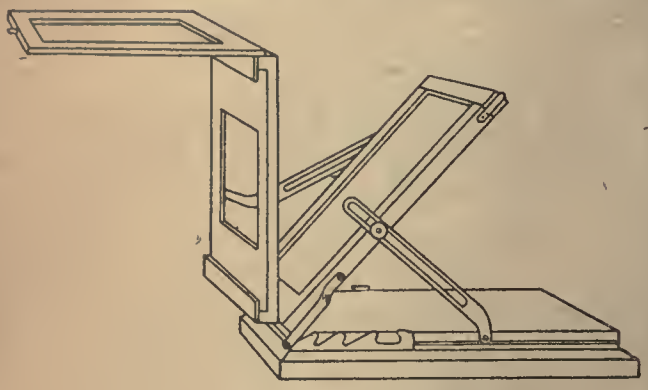


Fig. 3.

house of a friend. We understand that Mr. Morton is having the apparatus made in the best style and placed upon the market, but any inquiries as to when or where it will be obtainable should be addressed to him at 97, Chesterfield Gardens, Harringay, London, N.

NOTES ON THE PAGET PROCESS.

That photographers fail to obtain correct colour rendering when working the Paget colour process is, in my opinion, due to the fact that they overlook for the most part the importance of making a satisfactory transparency. If this is made too weak the result is, upon the final registration, weak in colour and lacking in brilliance; while if the transparency is made too dense or vigorous a totally false sense of colour is introduced; in the latter case, say, a pale yellow primrose is rendered as a flower of a deep orange hue. This is, in my opinion, the most important point in the whole process, and it is worth any photographer's while who intends to work this process to make a set of transparencies from the same negative, which should, of course, be of good quality, but of different depth and vigour. Registration will show almost at a glance which is the correct density. In passing, I may add that it is a wise rule always to expose the negative plates by meter and develop by time and temperature, thus ensuring negatives of a uniform quality. This part of the process becomes, as it were, standardised, and the worker need have no fear of his results, but may produce a perfect colour picture from each exposure. With regard to making the transparency, it is well to note that if this is to be projected through the lantern it should be less vigorous than when the picture is to be viewed in the hand. The matt ground plates also require to be slightly more dense than those with the clear emulsion.

Though this is, in my opinion, the most prevalent cause of weak or false colours, it is not the only point that needs to be taken into account. The other day I was consulted by a photographer with reference to some colour pictures of a group of anemones. These brilliantly coloured flowers were rendered very weakly in the transparency, and for some time I was at a loss to suggest the reason. The negative was of good quality, and the transparency showed nothing to complain of, being on the vigorous side. Subsequent investigation showed, however, that the exposure was made in a rather poorly-lighted room, which did not render the flowers at their best, with their full brilliance and tonal value. It is necessary to see that the lighting is such as emphasises the colours of the subject at their best and brightest, or the exposure should be, if possible, deferred until another time. Another point to be noted is that, while every attention may be given to the technique of the photograph, the lighting must be observed, or the plate may give a truer rendering of the image than did the photographer's own vision of exposure. In this the Paget process is the same as the other screen plate processes.—R. M. F.

BOOKS ON COLOUR PHOTOGRAPHY.

Perhaps the enquiry most frequently received by the editors of this publication is for a recommendation of the best textbook of colour photography, which very often is not an easy question to answer unless the requirements of the questioner are particularly known. This arises from the fact that the literature of colour photography is scanty. Moreover, it has received very few additions during the past ten years. Of the Autochrome process, a booklet is issued in English by the British agent for the plates, Mr. T. K. Grant, 89, Great Russell Street, Bloomsbury, London, W.C.1. There is no doubt a corresponding edition in French published from the headquarters of the firm of Lumière-Jougla Monplaisir, Lyons, France. The makers of the Paget plate, who issue literature on its use, are the Paget Prize Plate Company, Ltd., Watford, Herts., England. Apart from these makers' pieces of literature, the only book at present in print which deals both with the principles and practice of the colour screen-plates is "Photography in Colours," by Dr. G. Lindsay Johnson, the third edition of which was issued in 1916. The book includes descriptions of other screen-plates, not now on the market, and is also a treatise, written in a style characteristic of the author, on processes of colour photography in general. If not entirely free from literal errors and errors of opinion, it contains, nevertheless, the best general survey of methods of photography in natural colours which is at present obtainable.

Of textbooks on the general principles of colour photography and of methods of carrying them out according to the so-called additive and subtractive systems, there are two, neither of which are still in print, although, no doubt, obtainable through second-hand booksellers. The first of these two books is "A Handbook of Photography in Colours," by Thomas Bolas, Alexander A. K. Tallent, and Edgar Senior, published by Messrs. Marion and Co., in 1900. Mr. Bolas's portion is a very able review of the development of colour processes; Mr. Tallent's is a textbook in itself on the principles and practice of three-colour photography; but Mr. Senior's still contains the most practical working instructions for the Lippmann method of colour photography by the interference process. This book also is out of print, but not badly out of print; some dozens of copies were "remaindered" a year or two ago by Messrs. Foyle, of Charing Cross Road, London, W.C.2, so that it is a book which should be obtainable without much difficulty. The second of these is "Natural Colour Photography," by Dr. E. Koenig, translated from the German by E. J. Wall, and published in 1906 by Dawbarn and Ward, Limited. This book, written while the Autochrome process was still in an experimental stage, and no more was known of it than had been published in the makers' specification, naturally has very little to say on the one-exposure colour plates, although it briefly touches upon the work of Joly, and even on the Powrie plate, which for a while obtained some prominence. It is, however, a fairly comprehensive manual on the methods of producing colour prints by the assemblage of three colour monochromes.

A work somewhat similar to Koenig's is "Three-Colour Photography," by the Austrian officer, Baron Von Hübl, translated by H. O. Klein, the fourth edition of which is published by Messrs. Percy Lund, Humphries, Amen Corner, London, E.C.

About the only other manuals which may be mentioned are the issues No. 128 and No. 147 of the "Photo-Miniature," published by Tennant and Ward, 103, Park Avenue, New York. The first of these, issued in 1913, is an explanation of the modern methods of obtaining photographs in colours; the second, issued in 1916, is a practical manual on the working of the Autochrome and Paget processes, with some brief notes on the Ives "Hicro" and the Kodak "Kodachrome" methods. Both these manuals also are out of print.

No. 152. VOL. XII. JULY 4, 1919.

THE BRITISH JOURNAL OF PHOTOGRAPHY

MONTHLY SUPPLEMENT

ON

Colour Photography.

25

CONTENTS.

	PAGE
Autochrome Photography by Artificial Light. By Charles J. Belden	25
Six-Colour Cinematography	26
Decennia Practica—Colour Photography	27
Correspondence—The Bleach-Out Process	28

AUTOCHROME PHOTOGRAPHY BY ARTIFICIAL LIGHT.

Notes on the making of Autochromes by various artificial lights, contributed to the "Camera" by an American colour worker.

The screen-plate method of natural colour photography, whether it be the Autochrome, Paget, or any other practical process, has long since ceased to need introduction or explanation either to the professional or the amateur photographer; but like a great many other branches of photography, there are certain phases of natural colour work that have received the attention of only a few experimenters. This is perhaps only to be expected, for the ramifications of the process that produces all the colours are bound to be greater than those of a process whose results are in monochrome, and the problems of the former will, of course, require more detailed study.

The Autochrome process which was placed on the market some twelve years ago has enjoyed a widespread and deserved popularity chiefly among non-professional photographers, although a considerable number of studios have, from time to time, taken up Autochrome work in portraiture as a side issue. The bulk of Autochrome photographers work the process purely for the pleasure to be derived from it. This condition has been brought about chiefly by the fact that the colour plate is a little more difficult in manipulation than its black and white brother, both in the taking and the developing, and the impression has been gained that its application is too limited for professional workers. This is perhaps true, to a certain extent, just as it is true in monochrome work that the best results are obtained only under right conditions of atmosphere and lighting; but it has been the writer's experience that the Autochrome has far greater possibilities than is ordinarily supposed. During the past few years the scope of commercial photography has expanded steadily in all directions, but workers in this field have been slow to recognise the opportunities offered by photography in natural colours. The supposedly restricted field of colour photography is largely responsible for this condition, and a process that is not of universal application does not readily find favour with the commercial photographer.

Volumes have been written on the exposure and development of the Autochrome plate under normal conditions of lighting, with the result that this phase of the subject is pretty well understood. After a little experience, the percentage of failures with landscapes or other out-of-door work need be but small, notwithstanding that these plates require a very exact exposure for good results. Even more certain results may now be obtained in portraiture by the use of certain brands of flashlight powders manufactured especially for use with Autochrome plates. By using a given weight of powder, under fixed conditions, the uncertainty of exposure is eliminated and any variation in quality or intensity of light is dispensed with. Exceedingly beautiful results may be secured by this means, and detailed instructions for manipulating the plates under these conditions are readily obtainable. When, however, there arises the problem of making an Autochrome by other light than daylight or flashlight, the average photographer will probably throw up his hands without giving it a thought. Thus, a very interesting and what could be to the commercial photographer a very profitable field is allowed to remain almost untouched. Production of the unusual in photography, as in any other art, is always well repaid, and places the work of the originator on a plane above the majority.

It is not the purpose here to discuss the theories of light and colour as applied to the Autochrome plate, but to suggest merely what may be accomplished practically and simply under conditions of artificial illumination. It need hardly be stated that the colour rendering of an Autochrome is entirely dependent on the spectroscopic qualities of the light that reaches the plate. Only too often have most of us been reminded of this fact by the weirdly blue results obtained when the compensating light-filter has been forgotten. This filter is employed for the purpose of correcting the predominating blue-sensitiveness of the plate, and the colour of the screen used for daylight exposures is such as to cause the colour-rendering of the plate when viewed by daylight to be a very close reproduction of the original subject. It is not difficult, therefore, to imagine that any change in the quality of the light would require a change of screen. This is brought out strongly in the rendering of deep shadows. To the artist all shadows are blue, for in nature black does not exist, and this fact is always exaggerated by the Autochrome. The principal reason for this is that the shaded portions of a picture are illuminated by light reflected

from objects which alter its composition; therefore, the balance of the light-filter is destroyed, and strange and unexpected results are often obtained in reproductions of objects illuminated by light reflected from a coloured surface.

A large number of formulæ have been suggested for Autochrome light-filters for use with various illuminants, but the making of a light-filter is an exceedingly delicate and exact operation. It has been the writer's experience that by the judicious use of two or three standard filters excellent results may be obtained under nearly all conditions. In the first place, there is the daylight screen; secondly, there is the so-called "Perchlora" screen adjusted for use with the "Perchlora" flash powder; and thirdly, the magnesium screen for giving correct colour values in exposures with magnesium powder. All of these screens are readily obtainable and are standard products of the manufacturers of the Autochrome plate. After a few trials along the lines to be suggested, it will be found that beautiful effects may be obtained by artificial lighting.

One of the first problems that baffles the Autochrome worker is the photographing of interiors. The difficulty here arises from the altered colour rendering of objects illuminated by light reflected from some coloured surface and also from the inability to get daylight into some remote corner. Artificial lighting of the dark corners may suggest itself, but the false reproduction of colours will be obvious. A very simple solution is found by making one exposure by daylight with the regular screen, then drawing the blinds and lighting the dark portions artificially, using the "Perchlora" screen in place of the daylight filter. A very haphazard sounding procedure to be sure, but in the writer's experience productive of excellent results. In a number of cases fireplaces have been photographed in this manner, with glowing embers reproduced very faithfully. Brightly burning logs may be photographed successfully on an Autochrome plate by exposing for fifteen minutes at *f*/8 through a "Perchlora" screen.

Making Autochromes of electric fixtures is an interesting undertaking and not as difficult as it might at first seem; in fact, the first plate the writer exposed on a subject of this character proved to be a perfect reproduction. An exposure was first made on the fixture lighted from the inside by its own incandescent bulbs. With the lens working at *f*/8, a fifteen-minute exposure was given, half of it with no filter at all and half with the "Perchlora" screen on the lens. Two charges of "Perchlora" flash powder were then set off on either side of the camera; the colour rendering in the result was almost faultless.

During the Panama-Pacific Exposition I had occasion to make a considerable number of Autochromes of the night illumination, this feature of the Exposition being of a most spectacular, yet artistic nature. The buildings, in which were incorporated wonderful harmonies of colour, were illuminated at night by an indirect lighting, which produced an inconceivably beautiful effect. Autochrome exposures, through the regular daylight screen, were, of course, out of the question, and as an experiment an exposure was made with the "Perchlora" screen. The result was most satisfactory. With the lens opened to *f*/8, well-nigh perfect results were obtained by exposing on the buildings between three and four hours, depending on the brilliancy of the light. In a few cases, short exposures were made before dark with the regular daylight screen, and completed with the "Perchlora" filter after the lights were turned on. This method proved even more satisfactory than the first, and the added trouble was fully repaid.

In making Autochromes of subjects lighted partly by electricity and partly by daylight, it has been found that the "Perchlora" screen gives very nearly perfect colour rendering. In cases where daylight predominates, the magnesium filter produces the best results. Where most of the illumination comes from incandescent lights, exposures may be made partially through the "Perchlora" screen and partially with no screen at all.

The mode of procedure which has been suggested will undoubtedly seem to be more or less of a "hit or miss" and a somewhat expensive process, but having been worked out on a practical basis, it has proven most successful and has produced results which the average Autochrome worker would scarcely believe possible. Its success is, of course, largely a matter of judgment and a little experience; but the rapidity with which accuracy of judgment is acquired will be surprising. The very exact exposure required under ordinary conditions seems to disappear and a considerable latitude will be found within which excellent plates may be secured.

CHARLES J. BELDEN.

SIX-COLOUR CINEMATOGRAPHY.

[An additive process of colour cinematography, similar in its general principles to Kinemacolour but differing from the latter in the sequence and selections of the colour sensations, has been patented by Mr. Joseph Shaw, 8, South Second Avenue, Mount Vernon, New York, whose specification, No. 126,220, contains the following detailed description of the process.—EDS. "Colour Photography" Supplement.]

IN the production of moving pictures in colours as hitherto suggested, a rotary band screen was provided having arranged thereon three or more filters in which every alternate colour was a shade of red, the other two colours being green and blue.

For projecting pictures it was also suggested to dye the films corresponding to the colours of the screens through which the corresponding negatives were taken or to employ similar screens.

The invention has for its general object to provide means whereby the natural shades and tones of the subject photographed can be more nearly reproduced on projection; and the more specific object is to reduce to a minimum the "flicker" effect in colour moving picture projection.

With this end in view the invention consists in the production of a moving-picture film bearing continuing aspects of a subject in successive groups of six picture image-sections, each section showing a colour selection and three of which being of red colour are alternately disposed in their relation to the other three picture image-sections of the group, of which only one is of green colour selection and the remaining two are of primary colour selection other than red.

The invention further consists in making a positive film from the negative, and projecting it with the aid of recurring red and green filters, the picture image-sections of red colour selection being coloured by the red colour filter and the other picture image-sections each being coloured by a green colour filter.

The invention also consists in a method for projecting moving pictures in colours in a moving picture projector without the aid of colour filters in which the picture image areas of red colour selection of the film bear a red colour tint and the other picture image areas each a green colour tint.

Analysing the problem of "flicker" common to moving

pictures in colours comparison has been made with the regular "black and white" moving pictures and seemed that the trouble could be remedied if the positive film ready for projection in colours could be made of such quality that the differently coloured separated picture-sections comprising the image should not only show a difference in the opacities of the colour separated picture-sections, thus controlling and selecting the coloured light which it permits to pass, but these opacities should be arranged and regulated to such a degree that if projected without colour filters they should show, with the exception of the red colour separated picture-sections, images closely resembling the "black and white" moving picture where the amount of "flicker" is usually at a minimum.

This theory, later found to be a fact, is based on the view that the disturbance or "flicker" which is perceived by the retina of the eye is due to violent light changes caused by quickly and successively moving these picture section opacities alternating in contrast of strong light and shadows; what in one of the positive picture image-sections is expressed as a transparent light-passing spot is an opaque light-preventing spot in the next following picture image-section.

For illustration, if we think of the spectrum as one chain of graduated colours and hues extending from one end of the spectrum to the other, as soon as we take any link out we break the continued line of the chain and certain hues or shades of colours will be missing; the gradual colour scale will be disturbed, the absorption bands will be sharply defined and a "gap" between the primary colours of the spectrum will be formed which would cause upon the retina of the eye a sensation similar to looking upon a board marked with black and white checkers, a sensation causing an immediate disturbance to the eye, and if such a sensation is continued for a length of time the eye fatigue and "flicker" increases in proportion.

A similar sensation of "gaps" is caused upon the retina when different sharp cut primary colour filters are used in forming the different colour separated opacities on the film. Besides causing "flicker" these "gaps" prevent the eye from perceiving the colours in their natural shades and hues, as each missing link represents a colour shade or hue which is necessarily a part of the spectrum.

Further analysing the "gaps" it was observed that in the projection of the different primary colours, the "flicker" was mostly trying upon the eye when green or blue-green coloured light was being passed by sharply cut colour separated opacities; the red coloured light being passed by the red colour separated picture opacities did not cause much "flicker" or pulsating effect upon the eye.

From that time on efforts were directed to picture-section opacities representing separations of wave-lengths different from red, by regulating the opacities translating the photographic details from orange, green, yellow to blue shades of the subjects to such an extent that when a positive was made from a thus regulated negative film and was projected, for instance, in monochrome, say green light, a graduated scale of different hues of green colour was perceived ranging from deep green to a very light blue green shade, according to the natural colours of the subject: the green light sifting through the translucent or semi-translucent varying opacities of the picture image-sections and forming these different hues of green colour without any "gaps".

Then when the so regulated picture-image opacities were successively projected in green coloured light in combination with alternating picture-section opacities coloured in red light, not only was "flicker" materially reduced but remarkable true shades of different colour combinations very closely approaching natural colours formed by the mixture of red light alternating with different hues and delicate shades of green light filtering through the differently shaded and graduated opacities representing photographic details from orange, green, yellow to blue shades of colours of the subject or scene.

(To be continued.)

DECENNIA PRACTICA—COLOUR PHOTOGRAPHY.

Under this heading we apply to the various branches of colour photography the processes of collection and arrangement accorded to some fifty departments of ordinary photography in the "B. J." during 1916. These extracts are from issues of the "British Journal Almanac" of the years 1906 to 1915, and the present series of epitomes thus resuscitates and brings together in compact form much useful information, otherwise scattered through nearly a dozen volumes.—EDS. "Colour Photography" Supplement.

PHOTOGRAPHY IN COLOURS BY PRISMATIC DISPERSION.

(*Continued from page* 20.)

M. Raymond gives a much simpler method of working. To any ordinary camera is fitted a diaphragm D (Fig. 1) behind the lens O, which, though here shown as simple, can be the ordinary camera objective. T is a cross-lined screen, behind which is placed a prism, P, in front of the plate. It is obvious that we have here nothing more than the arrangement ordinarily adopted for half-tone work, with the addition of the dispersive prism. The cross-lined screen acts precisely as a series of pinholes, which form images of the diaphragm on the plate varying in size with the distances T-P and T-O. If the diaphragm is circular the images are circular (Fig. 2); if it is an elongated diaphragm the image on the plate is a line. It is obvious, then, that by varying the distance of the screen with a circular diaphragm one will obtain a stipple in which the circles touch one another (Fig. 5); or if the diaphragm is larger, then they are partially confluent (Fig. 6). If instead of a circular diaphragm an elongated rectangle or slit is used (Fig. 7), we shall obtain a series of lines, as shown in Figs. 9-14, which will vary in their nature as the distances between screen and diaphragm and screen and plate vary. In precisely the same way with a triangular, square, or polygonal diaphragm the images will be of the same shape and separated, juxtaposed or partially superposed.

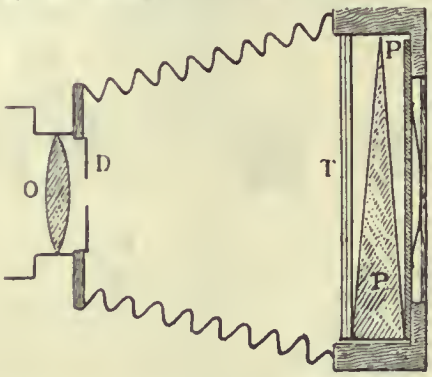


Fig. 1.

From an examination and comparison of this method with that given in the previous paper, it will be seen that all the essential elements

to give linear images exist separated by black spaces whereon are formed the spectra. For with a square diaphragm the screen plays the triple rôle of screen, ground glass, and multiple objective, replacing the second lens of the former arrangement, and all that one needs is then the prism, which forms the spectrum of each

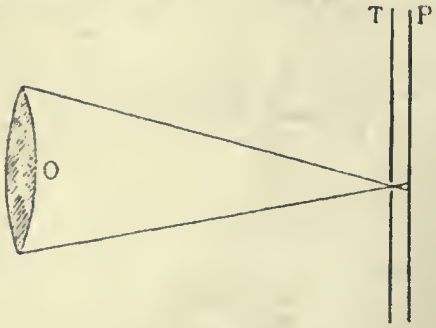


Fig. 2.

elementary line forming the image on the plate. When this negative is developed, a positive made therefrom placed in the same apparatus will immediately give a faithful representation in colours. A three-colour linear screen, the number of lines per inch being the same, applied behind this positive, will give an effect very near the truth.

The advantages of the apparatus are:—1. The use of ordinary

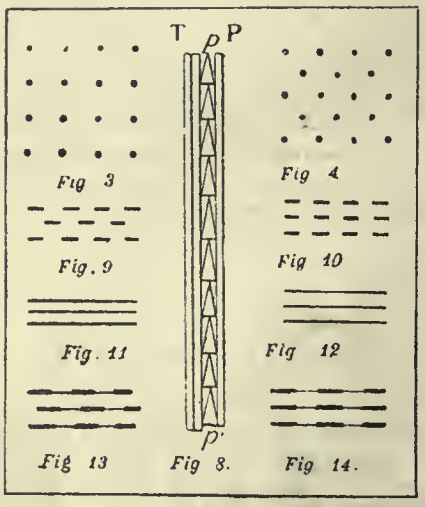


Fig. 3.

apparatus without modification, and by the simple addition of a commercial cross-lined screen and the prism. 2. The employment of a commercial screen. In practice it would appear more advantageous to use those in which the opaque lines are wider than the transparent interspaces; Schulze's 60 deg. screens perfectly fulfil this requirement. 3. The use of a prism with a narrow angle,

Fig 5. Fig. 6. Fig. 7.

so that there is no deformation of the image. 4. Reduction of the total cost. 5. Rapidity of exposure, this being much greater than with the original apparatus. 6. Regulation at will of the dimensions of the lines. 7. Regulation at will of the relative sizes of the spectra. 8. Utilisation, if required, of several prisms placed one on top of the other, as in Fig. 8. 9. Utilisation of the whole of the field of the lens. 10. The optical system is reduced to its simplest expression. 11. Simplification of focussing. 12. Facility with which this process may be adopted by all amateurs, thanks to the simplicity of the process. 13. Easy application to stereoscopy. —"Phot. Rev.," Feb. 17, 1907, p. 51; "B.J." Colour Supplement, March 1, 1907, p. 19.

M. Poirée suggests the following method for obtaining photographs in colours by prismatic dispersion. It is based on the non-achromatism of the lenses used, and does away entirely with the use of the prism. The system is based on the fact that if the lens is fitted with a diaphragm with annular or polygonal slit, and the image to be reproduced is divided into points by a screen, each point of the screen gives at the proper focus a spectral dot, which is round or oval, according to the position of the point of the screen with regard to the principal axis of the optical system. The distance of the points of the screen being adjusted to the optical system, the elementary spectral dots given by the collection of points of the screen are contiguous, and constitute the image to be reproduced, but the colours of which are separated. This image is received on an orthochromatic plate, developed, and converted into a positive and replaced. If the screen is illuminated by white light the photographic positive is illuminated in the natural colours, or if the positive is illuminated by white light it is the screen that reproduces the coloured image.—"Bull. Soc. Fr. Franc.," Jan. 15, 1907, p. 61; "B.J." Colour Supplement, March 1, 1907, p. 21.

J. and E. Rheinberg have dealt exhaustively with the theory and practice of the method of producing, on one plate and at one exposure (by means of prismatic dispersion without the use of colour filters) colour photographs which may be viewed either by projection or in a viewing instrument. They demonstrated the process, as embodied in the apparatus perfected by themselves, before the Royal Photographic Society. The full text of their paper appears in the April issue of the "Photographic Journal," and is reprinted in "B.J." Colour Supplement, May 3, p. 19; June 7, p. 28; July 5, p. 33; and August 2, p. 38; 1912.

Correspondence.

**** Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

**** We do not undertake responsibility for the opinions expressed by our correspondents.*

THE BLEACH-OUT PROCESS.

To the Editors.

Gentlemen,—In your issue of June 6, 1919, p. 22 of Colour Supplement, you give such an adverse verdict on the bleach-out process that it may deter experimenters from proceeding further with the idea. While of necessity having to agree with you concerning many of the results which were obtained, still, it is a fact that with certain of the samples distributed with such generosity by Dr. Smith, colour records were made which, so far as I am aware, are unobtainable by any other process than that of Lippmann. Looking back now some twelve years, it would seem that the chief cause of the failure of the process was its being put forward as a commercial proposition before the known difficulties attending its working had been mastered. Some of your readers may remember my exhibiting a record of the solar spectrum, made by a camera exposure, at the R.P.S. exhibition in 1908. This was made on the only satisfactory paper out of several submitted, the unbleached paper being almost black, and possibly a chance approach to perfection. I have purposely not interfered with this colour record in any way, and, so far as I can judge, it is as good now as when made eleven years ago. At that time I had persuaded one or two chemical friends to investigate the problem of the relation of fugitiveness of aniline dyes to molecular constitution, but recent events put an end to most of that. Considering the wonderful success of Sir William Pope in furnishing us with the new dyes for plate sensitising, I trust our chemists will be able to solve the problem of matching three dyes to give a black mixture of sufficient sensitiveness, which will at the same time give a stable reduction product and thus enable this most attractive process to have a satisfactory trial.

Cambridge. C. P. Butler.

No. 153. VOL. XII. AUGUST 1, 1919.

THE BRITISH JOURNAL OF PHOTOGRAPHY

MONTHLY SUPPLEMENT

ON

Colour Photography.

CONTENTS.

	PAGE
Six-Colour Cinematography	29
A Review of Colour Photography. By H. E. Rendall	31

SIX-COLOUR CINEMATOGRAPHY.

[An additive process of colour cinematography, similar in its general principles to Kinemacolour but differing from the latter in the sequence and selections of the colour sensations, has been patented by Mr. Joseph Shaw, 8, South Second Avenue, Mount Vernon, New York, whose specification, No. 126,220, contains the following detailed description of the process.—Eds. "Colour Photography" Supplement.]

(*Continued from page 27.*)

In order to register on the moving panchromatic negative film the colour selected picture-image section-opacities for the purpose above described there was used in the taking camera in front of the negative film a movable colour screen geared to travel in synchronism with the film, the screen having six openings, each filled with one colour-filter, these six colour-filters comprising three colour-filters of short wave-length and consisting of green, yellow, and blue colour respectively, and three colour-filters of a long wave-length and each consisting of a red colour only, so arranged that each of the three red colour filters alternated to form a pair with one of the three different colour-filters of the short wave-length. When thus arranged and used in combination with a panchromatic negative film these six colour-filters register lengthwise of the film picture-image section-opacities in the following order: red, green; red, yellow; red, blue; thus forming an unbroken chain of colour separations having no "gaps".

A positive is made from this negative film and although red, green, yellow, and blue colour filters were used in the taking, it is possible to project the positive with two primary colour-filters only, namely, red and green. The picture image-section of red colour selections passing red coloured light and the picture image-sections of green, yellow, and blue colour selection each passing green coloured light.

The patentee believes himself to be the first to use in taking moving pictures in colours a movable colour screen filled with six colour-filters so arranged and selected to register on the panchromatic negative film groups of six colour selected picture image-sections, three of which represent red colour value and the balance of three colour selected picture image-sections representing green, yellow, and blue values and so arranged that the picture image-sections of red colour selection are registered every other one and the picture image-sections of green, yellow, and blue colour selection are each registered once in every group of six picture image-sections, when a positive is made therefrom to project the picture image-sections of red colour selection in a light of red colour and the picture image-sections of green, yellow, and blue colour selection each in a light of green colour.

Thus, in each group of six picture image-sections, the red images, alternating in projection with the green images, and each green image showing a different density or shade of green colour influenced by the difference in the opacities of the green, yellow and blue colour selections, form in the projection of

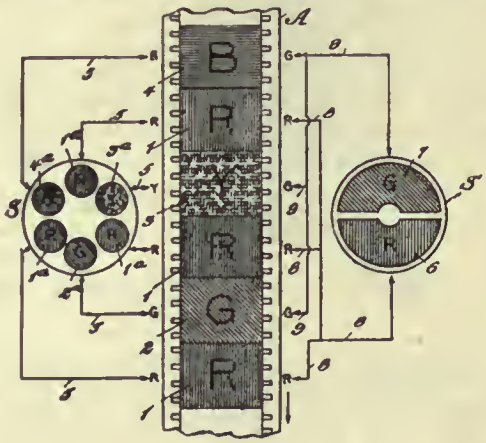


Fig. 1.

each group of six picture image-sections three different pairs of colour mixtures, and when overlapped in the eye of the observer by persistency of vision produce moving pictures in colours, very nearly approaching colours of nature with a minimum amount of flicker; or the positive film bearing the successive groups of six picture image-sections of colour selection can be directly tinted, dyed or toned photographically, in which case the picture image-sections of red colour selection will bear a red colour tint and the picture image-sections of green, yellow, and blue colour selection will each bear a green colour

tint, and the projection of the positive film will take place without any recurring colour filters.

It will be clear from the above that although the positive film is projected with the aid of two primary colour filters only, the projection effects a wider range of colour tints than has been possible with any other method, but by the method of taking the pictures it is claimed that it is possible to enhance still more the variety of tints in the colour combinations by utilising in projection a recurring colour screen having four openings, two of which are filled with red colour filters, each being of a different shade, for instance, pure red and orange-red; the other two openings of the screen filled with green colour filters, likewise differing in shade, a blue-green and yellow-green, and so arranged to move in relation to the film that as one picture image-section appears at the gate of the projector, one colour-filter passes in the path of the light. Thus, in one complete revolution of the colour screen four picture image-sections will have passed the gate, thus providing means whereby the picture image-sections of red colour selection can be alternately coloured by pure red and orange-red filters and the images of green, yellow and blue colour selection can be coloured by alternating blue-green and yellow-green filters.

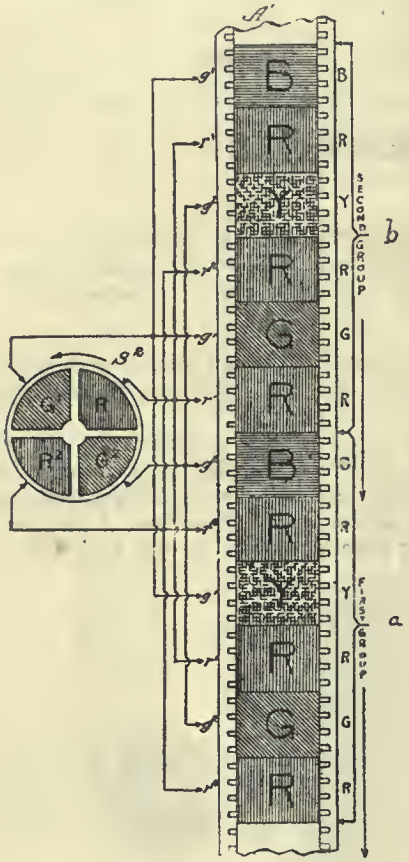


Fig. 2.

In the drawings, fig. 1 is a diagrammatic view showing a section of film and the relation of the picture image-sections to the picture-taking screen when the film is regarded as a negative and to the projection screen when the film is regarded as a positive; fig. 2 is a view showing a positive film with its picture image-sections operatively related to the colour screen used in projection; fig. 3 is a view showing a section of a negative film and the relation of the picture image-sections to the picture-taking screen and the relation of the image-sections of the negative film to the tinted corresponding image-sections of the positive film and to the positive film projection screen when the film is regarded as a positive; and fig. 4 is a similar view showing a positive film in four tints.

Referring to fig. 1, A designates sufficient of a film to include a group of picture image-sections of which alternate sections 1 are red colour sections, as designated by the letter R, and the sections 2, 3 and 4 intermediate adjacent sections 1 are green, yellow, and blue colour sections, as designated by the letters G, Y, and B. Adjacent to the film, which is to be regarded as a negative, is a colour screen S which moves in synchronism with the film by any approved manner and is employed in taking of the moving pictures. This screen has three red colour filters 1^a, which are substantially of a colour selection of the same wave-length, through which the picture sections 1 of the film group are exposed. The screen also has green, yellow and blue filters 2^a, 3^a, and 4^a respectively, arranged in alternate relation to the red filters. The relation of the colour filters to the picture image-sections can be traced by the connecting arrow lines 5.

In fig. 1 is shown the screen S^1, which is used in projecting

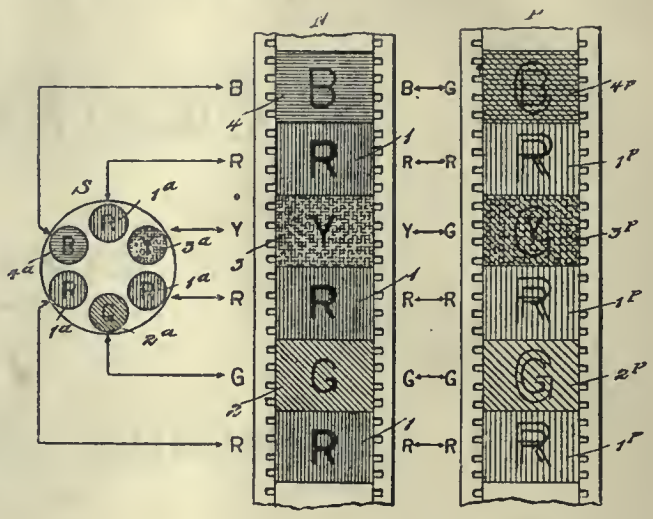


Fig. 3.

the moving picture image-sections. This screen has two filters 6 and 7 which are red and green, as designated by the letters R and G. This screen is moved in such relation to the film A, which is assumed to be a positive in this explanation of the screen S^1, that the red filter 6 will register with the successive red image-sections 1 of the film and the green filter 7 will

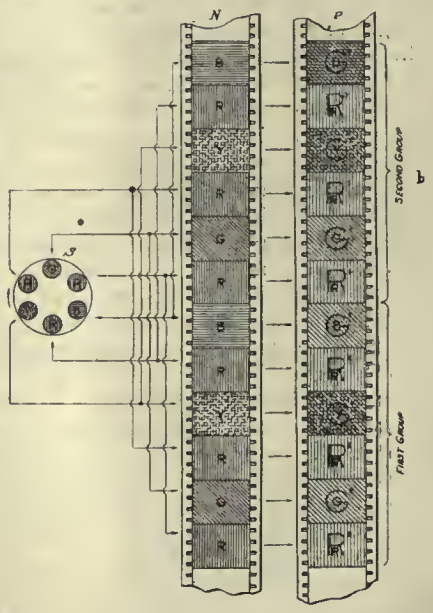


Fig. 4.

register alternately with the green, yellow and blue picture sections 2, 3, and 4, this relation being indicated by the arrow lines 8 and 9, respectively.

Fig. 2 shows a portion of a negative A^1 with two groups of moving picture sections, and the projecting screen S^2 has two groups of red and green filters designated R^1—G^1 and R^2—G^2, respectively. The relation in which these various filters register with the image-sections of the film can be traced by the arrow lines designated respectively g^1—r^1, g^2—r^2.

It will be clear by reference to fig. 2 that the picture image-sections of green, yellow, and blue colour selection in one group of six picture image-sections are differently affected by the G^1 and G^2 filters than they are in the next following group. In a given group, for instance, the picture image-sections of green and blue colour selection are affected by the G^2 filter and the picture image-section of yellow colour selection is affected by the G^1 filter, but in the next following group the order reverses—the picture image-sections of green and blue colour selection will be affected by the G^1 filter and the picture image-section of yellow colour selection by the G^2 filter. Also, in every group, that every other picture image-section of red colour selection is affected by the R^1 filter and the intermediate picture image-sections of red colour selection by the R^2 filter.

In further reference to the drawings, fig. 2, illustrating the projecting method with four filters, the R^1 is a pure red and the R^2 is an orange-red filter; the G^1 is a yellow-green filter and the G^2 a blue-green filter. Assuming that the screen revolves to the left, the R^1 filter will follow the G^1 and the R^2 filter will follow the G^2, and when in combination with the differently colour-selected picture image-sections, projected at a speed of about thirty pictures per second, each two successive picture image-sections are alternately coloured by the red and green filters and are overlapped by persistency of vision, thus forming pairs, the colour combination of which are being successively varied, due to the changing relation of the different colour filters in combination with the varied colour selections of the picture image-sections, for example, as shown in the drawing, the film passing downward in a given group of six picture image-sections, beginning with a picture image-section of red colour selection and the R^2 filter, the R^1 and G^2 filters affect the picture image-sections of red and green selection, whereas in the following group of six picture image-sections the picture image-sections of red and green colour selections will be affected by the R^1 and G^1 filters; likewise, in the first group the picture image-sections of red and yellow colour selection will be affected by the R^1 and G^1 filters, whereas in the following group the picture image-sections of red and yellow colour selection will be affected by the R^2 and G^1 filters; so, also, in the first group, the picture image-sections of red and blue colour selection will be affected by the R^2 and G^2 filters, and in the following group the picture image-sections of red and blue will be affected by the R^1 and G^1 filters.

Referring to fig. 3, N designates a negative film and S a colour screen substantially the same as described in connection with fig. 1.

P designates the positive film, of which 1^P are the picture image-sections corresponding to the red section 1 of the negative film N, the gelatine of which is tinted red. The picture image-sections 2^P, 3^P and 4^P correspond respectively to the sections 2, 3 and 4 of the negative film, the gelatine of which is tinted green; with a positive thus tinted projection is made without the use of recurring colour filters.

In fig. 4 the screen S and negative film N are the same as in fig. 3, but a greater length of the negative film is shown to bring out the relation of several groups of picture image-sections in the positive film P^1.

To effect a wider range of colour tints it is possible to enhance still more the variety of mixtures of different wave-lengths by tinting my film into two different tints of red colour and two different tints of green colour, for instance, pure red and orange red, blue-green and yellow-green, designated as R^1—G^1 and R^2—G^2.

It will be clear by reference to fig. 4 that in the positive film P^1 the picture image-sections of green, yellow, and blue colour selection in the group *a* of six picture image-sections are differently affected by the G^1 and G^2 tints than they are in the next following group *b*. In a given group, for instance, the picture image-sections of green and blue colour selection are affected by the G^2 tint and the picture image-section of yellow colour relection is affected by the G^1 tint, but in the next following group the order reverses—the picture image-section of green and blue colour selection will be affected by the G^1 tint and the picture image-section of the yellow colour-selection by the G^2 tint. Also, in every group, every other picture image-section of red colour selection is affected by the R^1 tint and the intermediate picture image-sections of red colour selection by the R^2 tint.

Fig. 4 illustrates the film ready for projection in four tints. The R^1 is a pure red tint and the R^2 is an orange-red tint: the G^1 is a yellow-green tint and the G^2 is a blue-green tint, and when projected at a speed of about thirty pictures per second, the picture image-sections bearing their respective tints are overlapped by persistency of vision, thus forming pairs, the colour combinations of which are being successively varied, due to the changing relation of the different colour tints in combination with the varied colour selections of the picture image-sections. For example, as shown in the drawing, assuming the tinted film travels downwardly, beginning with the picture image-section of red colour selection bearing the R^2 tint, it will be plain that in a given group of six picture image-sections the R^2 and G^2 tints affect the picture image-sections of red and green selection, whereas in the following group of six picture image-sections the picture image-sections of red and green colour selection will be affected by the R^1 and G^1 tints, as shown in the drawing.

A REVIEW OF COLOUR PHOTOGRAPHY.

With peace almost assured in most parts of the civilised world, the enthusiast for colour photography may rightfully look forward to renewing his interest in this beautiful art, and he may be excused if he hopes that more manufacturers will devote attention to supplying his needs. Looking back through my "Colour Photography" supplements, it is perfectly plain that there has been a great falling-off of interest in this branch of photography during the last few years, if one may except a "certain liveliness" among the colour cinematograph patentees, but these hardly interest the amateur. Personally, much as we admire colour transparencies, most of us would prefer pictures to frame or paste in albums. I therefore propose to give a brief review of the various paper processes offered to the public at different times, and trust that those who have tried them will give their experiences and criticise what I have written. Practically all paper processes require three superimposed prints from negatives taken through appropriate colour filters, and it is not superfluous to add that every process in colour photography requires unvarying exactness and uniformity, failing which the picture is spoilt by predominance or deficiency in one colour. Errors of exposure or printing which would be unnoticed in monochrome work may give green faces or brown grass in colour photography. I give below a list of methods for producing these record negatives, some of which I have tried.

(1) An ordinary camera, with a filter holder on the lens. In this case ordinary dark slides are used.

(2) *Repeating Back.*—This is an apparatus that fits on the back of a camera, and consists of a frame holding a long, dark slide, in front of which is a sliding filter-holder, which moves

with the dark-slide. The three exposures are made on the same plate, alongside one another.

(3) Sanger-Shepherd one-exposure camera.
(4) Hiblocks.
(5) Butler's one-exposure camera.
(6) Hamburger's one-exposure camera.
(7) Screen plate negatives.

No. 1 is quite good enough for preliminary experiments, and is not costly. Still life and copying can be done satisfactorily, but No. 2 is much more convenient to use. A repeating-back outfit is quite rapid enough for taking portraits, and, on reasonably calm days, landscapes. Curiously enough, I have never had much trouble with colour frills due to movement between exposures. First-class sets of negatives can be obtained if the following three precautions are taken: (*a*) Use colour filters and plates made by the same firm. (*b*) In selecting plates, use only those for which the makers give the factors for tricolour filters. If this is not done, a good deal of material and time has to be wasted in photographing a neutral-tinted object, adjusting the exposures till three identical negatives are obtained. This procedure is more profitable for the plate-maker than the amateur. There is at least one maker who gives these factors, and one may suppose that they are a good deal more accurate than the operator would find for himself. (*c*) Use an exposure meter.

No. 3.—This is a development of the three-lens camera. The three-lens camera has the obvious disadvantage that the three images can never register unless the object is a very distant one. In the Sanger-Shepherd camera one lens is used, and two big rhomboidal prisms transfer two images, one to each end of a single long plate. The centre image (red filter) passes between the edges of the prisms, which thus form a sort of square diaphragm of constant opening. A small strip only of the front face of the prisms intercepts the rays from the lens, and this strip is provided with a shutter to regulate the light passing through to each plate. This shutter is thus really an adjustable diaphragm, to be adjusted by trial and error, to allow for variation in exposure required by each filter, the red filter being the standard by which these two are set. The lens is provided with a yellow filter, in order that the diaphragm openings for all three pictures may be approximately equal in area. In actual practice I have found that when photographing near objects a uniform background must be used, as the "stereoscopic error" is quite pronounced. Sometimes I have found a difficulty in registering, even where distant objects are concerned. This I have not had satisfactorily explained. At the time the firm was busier with war work than colour photography, but on my return to England I propose to subject it to more severe tests, and write a further account of my experiences. It is fitted with a comparatively long focus lens, which makes it somewhat awkward to use at times. In rapidity it compares with an Autochrome plate. Another disadvantage is its cost—£40 for the lantern plate size (pre-war). In the above-mentioned processes the same make of plate can be used throughout, developed, and fixed for the same time, thus ensuring uniformity in the quality of the negatives.

No. 4.—I obtained some Hiblocks from America with great difficulty during the war, but I never used them in the absence of any proper holder, labour difficulties preventing me getting one made in England. A Hiblock can be used in any camera fitted with the holder, and the Hesse-Ives Co. list holders for all makes of American cameras. My memory is a little treacherous as to their build up, and I am open to correction, but, as far as I remember, a Hiblock consists of the following: (*a*) A slow speed plate with transparent emulsion, glass to the lens. This gives the blue filter negative. (*b*) A celluloid film, with emulsion, strongly stained red. This gives the green filter negative. (*c*) A panchromatic plate, emulsion side to lens. This provides the red filter negative.

In the absence of a practical test of the Hiblock, I can hardly criticise it beyond saying that the firm issue the most complete instructions for it, and also run a department for developing and printing amateurs' exposures. I was most pleasantly impressed by the careful way all goods I received from the Hesse-Ives Corporation were packed.

No. 5.—This camera got to the practical stage by being put on the market some years ago by A. W. Penrose and Co. The camera was of the three-plate type, and provided with two transparent coloured glass reflectors. The first reflector, at 45° to the axis of the lens, reflected a proportion of the light to the blue filter plate, placed horizontally on top of the camera. This reflector was of yellowish glass, so that reflections from the back surface were cut out by the blue filter. The remaining light was partly intercepted by a transparent reflector, which served the green filter plate, placed horizontally, but on a lower level than the blue filter plate; and the red filter plate was vertical and directly in line with the lens, the light being filtered by the two reflectors which were appropriately coloured. I speak from memory when I say that the ratio of exposures was adjusted by interposing neutral tinted glasses between the plates and their source of illumination. I understand that registration was a sore point with this camera, but as I never used it, I would prefer that others gave their experience. At any rate it was far more rapid than any of the preceding apparatus.

No. 6.—This camera has the credit of being the only three-colour camera that has been successfully used in a professional studio. It has one transparent red platinised reflector that serves the blue and green record plates, placed horizontally face to face on top of the camera, and this reflector also acts as a filter for the red filter plate, placed as in the last camera vertically, facing the lens. Its special feature was a device for bending the reflector, this distortion being purposely introduced to correct any deficiency in registration. It was capable of snapshots under favourable conditions, but unfortunately was never offered for sale to the public.

No. 7.—I believe the future of colour photography lies in this direction, although Nos. 1 and 2 will always be used. I read with great interest the account of Mr. Williams' work, as I had in my mind a somewhat similar process. The Autochrome, Paget, and others have proved that it is possible to obtain three records on one plate. I think it should be possible to devise a special border pattern for the Paget screen for registering. For instance, suppose we wish to obtain a red record negative from an ordinary Paget. For this we must have a monochrome screen with opaque areas over the blue and green dots and clear glass for red dots. By photographic means it would not be hard to make such a screen, but it must have along the edges a special border of red dots so that when the screen and negative are registered a red border would appear round the negative. It is about time that some one devised a registering frame with fine screw adjustment for Paget transparencies. With such an apparatus and a magnifying glass registration should be obtained fairly easily, the two bound together with lantern-slide binding, and printed through an enlarging lantern. In a similar way blue and green negatives could be projected, blue and green borders being arranged in order that there might be no mistake. Probably a little diffusion would get rid of the grain without producing too soft a result.

H. E. Rendall.

(To be continued.)

Society of Colour Photographers.—A meeting of the committee of the society was recently held in order to consider the desirability of resuming the meetings and excursions. After some discussion it was decided to postpone calling a general meeting of the members until conditions for the practice of the more widely used colour processes have become more favourable.

No. 154. VOL. XII. SEPTEMBER 5, 1919.

THE BRITISH JOURNAL OF PHOTOGRAPHY

MONTHLY SUPPLEMENT

ON

Colour Photography.

CONTENTS.

A Review of Colour Photography By H. E. Rendall 33
The Laboratory Preparation of the Colour-Sensitising Dyes, Pinaverdol and Pinacyanol 34
Correspondence—
The Butler Three-Colour Camera—Is Three-Colour a Blind Alley? 36

A REVIEW OF COLOUR PHOTOGRAPHY.

(*Continued from page 32.*)

Paper Printing Processes.

In dealing with methods of producing prints on paper, there is obviously no useful purpose served in referring to such obsolete processes as Pinatype, gum-bichromate, stripping films, etc., and I will limit myself to such processes as were in common use before the outbreak of war. These include the following:—

1. Carbon process.
2. Raydex.
3. Sanger-Shepherd imbibition process.
4. Hicro.
5. Polychromide.
6. Bromoil transfer.
7. Bleach-out process.

Wasted time and money have taught me two lessons which I intend to follow for the rest of my photographic life: (*a*) Never attempt to print from any but a perfect set of negatives. In such a set neutral grey is represented by equal density in each negative. By taking trouble these are not so hard to produce as it is commonly supposed. (*b*) Always print a test scale together with the negatives.

Perhaps my intention in (*b*) is not quite clear. It is not sufficient to produce three nice-looking prints in yellow, pink, and blue, superimpose them, and expect to get a perfect result. It is an absolute sine quâ non to know whether they are balanced. I can see only one way of guaranteeing this, and that is by constructing a kind of fraction tint actinometer to lie alongside the negative while printing. For the sake of argument we may arrange for six numbered tints, and assume that No. 4, just visible, will give neutral greys and a print of suitable density. If No. 3 is only visible in the blue and No. 5 in the red, we shall know that although the three pictures independently look all right, they will not combine, and we should be able to know from previous experiments how much more we have to expose the blue and diminish the printing time for the red picture. Whether we use 3, 4, or 5 as the average tint, of course, depends on the density of the negatives. Some such system is applicable to all three-colour printing processes, and as far as I can remember is included in the Hicro process. However, I will now pass on to a short criticism of the processes enumerated above.

1. The double transfer process is, of course, used, and the best temporary support is celluloid. No one of average ability ever has any difficulty in stripping and registering the three prints. I prefer white opal for developing the yellow picture on. The chief difficulty in the process is that each tissue requires a different time of exposure, and in a varying light this is difficult to guage. Some workers even go so far as to recommend different strength sensitizing baths for each colour. I suggest printing not less than a dozen sets at a time, and choosing by trial the best three for any particular print. The process could be simplified by using a steady artificial light.

2. This is a form of Ozobrome worked out with great attention to detail by the Raydex Company, who supply all materials. Before going any further I think it will not be out of place to mention that they have managed to keep their flag flying during the war, and have never been too busy to give enquirers every help in working their process. The colour picture is obtained from carbon tissue, but instead of exposing this to light, it is "sensitized" by two solutions and squeegeed to a bromide print. The carbon print is the result of chemical action between the print and the tissue. With three good bromides to start with, this is a more accurate means of obtaining a print than exposing tissue in the ordinary way. The company have also obtained prints from P.O.P. which will still more simplify the process. I am sure readers of the "B.J." will await with interest further developments of this process, which should be easy and certain; but I must confess that I have found it a bit capricious. Possibly this may be due to the fact that I have only worked it in the narrow space of a ship's cabin, and with insufficient facilities for a proper washing in between the various operations. In both this and the carbon process, a colour that is deficient may be intensified by bathing in an appropriate aniline dye.

3. I have never seen more beautiful or perfect results than those obtained by this method, and every time I see them I always feel that any expenditure of time and money is justifiable to obtain the skill requisite to produce similar results. Print plates are first made from celluloid films sensitized in bichromate. These are printed in daylight, celluloid side to the negative, and then developed in warm water, which gives a positive image in silver bromide. This is dissolved out by hypo, followed by a thorough washing. It is then best to allow the films to dry. When dry they are placed in pink, yellow, and blue baths, from time to time they are rinsed, and roughly registered until a correct balance of colour is obtained. The first print plate, preferably pink or blue, is squeegeed to a piece

of gelatine-coated paper, well soaked, which absorbs all the dye, and this is then followed by the remaining two plates.

4. This process is very similar to the above, except that the films are supplied ready sensitized and varnished to protect them. In this way they will keep good for three months or so. Before development this varnish is removed by petrol or benzine. There is no difficulty in this, as any varnish not removed shows up as soon as the film is put in the water, and can at once be wiped off with cotton-wool and petrol. It is cleared with hypo, washed and dyed as in the Sanger-Shepherd process. The films, however, are not used as print plates, but are registered and sealed together over a piece of gelatine-coated paper by amylacetate.

5. This process has never been on the market. It was used by the Dover Street Studios, in conjunction with their special camera, for professional work. The base is a bromide print toned to beautiful chrome yellow. To this a blue-toned bromide print is transferred, and the final red print is made from a specially transparent carbon tissue.

6. I confess to never having seen a three-colour Bromoil transfer, but it is fair criticism to say that it does not lend itself to such accurate work as the foregoing processes, but where the operator is an artist, no doubt, satisfactory pictures are obtained, or, at any rate, pictures satisfactory to those who admire this process. A recent issue of the "B.J." gave a description of a similar process, "Wartype," which approximates to collotype. Owing to opacity of the inks used "overlapping error" is sure to be prominent. Overlapping error is the error caused by the lower layers of colour being unable to exert their full influence due to the opacity of the upper layer, which gives a predominating tint. I think it will soon be hard to know where Bromoil transfer ends and collotype begins.

7. This is a process which was beginning to go ahead when war broke out. Its principal exponent was Dr. Smith, the inventor of "Uto" paper. Unfortunately, he has died during the war. Uto paper was coated with a film containing dyes of the three primary colours, mixed together until a black or dark olive-green film was obtained. The paper was placed under a colour transparency, and under the action of light began to bleach in the light parts. By the well-known law of light, that a coloured substance is only affected by those rays which it absorbs, the blue and yellow dyes (forming green) began to fade away under a red area, leaving the red dye untouched; and in a similar way under all coloured areas, the dyes of a complementary colour faded, leaving a positive image of correct colouring, or at any rate this was the theory. However, I fear the number of spoilt Autochromes exceeded the number of good prints produced. The fugitiveness of the dyes was increased by "sensitizers" such as anethol or thiosinamine. The prints were fixed by dissolving out the sensitizers, and I presume there was something else in the bath to increase the stability of the dyes. If a print had a tendency to go pink during printing, green glasses were supplied to place over the whole until things went right. As the process has been slowly developing for at least fourteen years, perhaps it may ultimately be satisfactory. Another variation of this process has not yet had much of a trial, and that is to bleach out each colour independently. Thus we might have blue, pink and yellow tissues on thin waxed celluloid bases. Bleach each out under a monochrome positive, using an actinometer scale with each print, and then transfer them in succession to a paper base.

"Of the making of many books there is no end," says the Prophet, and the same might be written about processes in colour photography; and if an excuse is required for describing a process which I have never actually put into practice, it is because I have evolved it after many years' experience. I do not claim anything new or revolutionary for it, but I think that amateurs should be most successful with it. I expect it has been used many times, in fact, I know it has, but I intend to use it in the future. Briefly, the outline of it is as follows: The red-filter negative is hardened and given two or three coats of celluloid varnish. The base of the colour print is a bromide print toned blue. This has to be well soaked in water before using, otherwise it will be impossible to register the other two components. At the bottom of the print, space is found for the actinometer scale, which should include at least three tones. The yellow and pink prints are formed from carbon tissue, which is made up with a small proportion of silver bromide instead of pigment. This is treated in the same way as an ordinary double-transfer carbon print, using celluloid as the temporary support. These two prints are washed, cleared and dyed as for the Sanger-Shepherd process, but the pink print carries its scale at the bottom of the picture, and the yellow at the top. When judged correct the pink print can have its scale registered with the blue, and the yellow on top. The two scales being at opposite ends, the yellow picture is clear of the back of the pink, so that there is no danger of it being scratched. I have found that there is no danger of the pink dye transferring to the bromide print in the short time necessary for testing. With the number of different brands of bromide paper on the market I do not think it would be hard to find one with the same scale of gradations as the gelatine-dye picture. Of course, the blue picture could be made in the same way as the pink and yellow, but in this case a special baryta-coated transfer paper would have to be used, otherwise the dye would diffuse into the pores of the paper and give a blurred print.

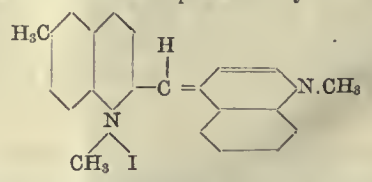
H. E. Rendall.

THE LABORATORY PREPARATION OF THE COLOUR-SENSITISING DYES, PINAVERDOL AND PINACYANOL.

A contribution from the Colour Laboratory of the United States Bureau of Chemistry, which is reprinted below, describes in detail the chemical preparation of the two dyes, pinaverdol and pinacyanol, which are chiefly used in the preparation of orthochromatic and panchromatic plates. The methods worked out for the preparation of the intermediates used in the making of these dyes—namely, the quinoline bases and the quaternary halides—have been the subjects of separate communications, copies of which are available from the Colour Laboratory, Bureau of Chemistry, United States Department of Agriculture, Washington, D.C.—Eds. "B.J."

The photo-sensitising dyes that have gained the ascendancy in panchromatic plate manufacture are two derivatives of quinoline, termed "pinaverdol" and "pinacyanol" by the German dye manufacturers. Since 1916 these dyes have also been produced by British manufacturing chemists under the names "sensitol green" and "sensitol red" respectively. We have made more than fifteen dyes of this general type[1]. A study of their absorption spectra, together with the results of photo-sensitising experiments carried out under the direction of Drs. Merrill and Burns, of the Bureau of Standards, and by Mr. H. A. Piper, of the Chemical Section of the Science and Research Department of Aircraft Production, has shown the identity with the above-named German and British products of two of our dyes, which we have termed respectively "Pv. I." and "Pc. IX."

Pinaverdol is prepared from a mixture of the methiodides[2] of toluquinaldine and quinoline by the action of alkali and air. The probable constitution[3] is best represented by the formula:

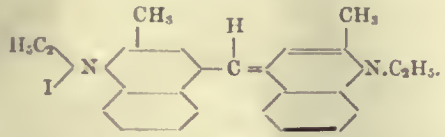


[1] The work on photography formerly carried on in connection with the Chemical Section of the Science and Research Department of the Bureau of Aircraft Production is now being completed by the Colour Laboratory, Bureau of Chemistry, Washington, D.C.

[2] Wise and Adams, Journal of Industrial and Engineering Chemistry, 10 (1918), 801.

[3] The mechanism of the formation of these dyes has been discussed in an earlier communication from this Laboratory (Wise and Adams, *Loc. cit.*).

Pinacyanol is prepared from a mixture of the ethiodides[3] of quinaldine and quinoline, by the action of formaldehyde and alkali. The constitution of this dye is still in doubt, but from present indications it is problematical whether the quinoline ethiodide actually enters into the reaction. If it does not, the formula[3] of the dye becomes :



When pinacyanol is treated with an excess of silver chloride under proper conditions, it is quantitatively converted into the corresponding chloride (Pc. XII.). The greater solubility of the chloride renders it more suitable than pinacyanol (iodide) for use in bathing plates.

In the synthesis of these dyes we have been guided largely by the German patents[4], which give good descriptions of the methods of preparation, but which fail to emphasise a few necessary precautions. The details of our own procedure for the preparation of Pv. I. and PC. IX. and XII. are given in the following experimental part :—

Pv. I. (Pinaverdol or Sensitol Green).—Fourteen grains of *p* toluquinaldine methiodide and 25.8 gms. of anhydrous quinoline methiodide are dissolved in 400 ccs. 95 per cent. alcohol. The solution is heated to boiling and 77 ccs. of 0.7 *N* alcoholic potassium hydroxide (= 3.0 g. of potassium hydroxide) are gradually added from a burette. The mixture is maintained at its boiling point for 5 minutes after the addition of the alkali is complete. Fifty ccs. of alcohol are then added, and the crimson-coloured solution is permitted to cool slowly. A blue-black, granular, crystalline mass is deposited. The crystals are filtered and dried. The weight of the crude dye is about 5.5 gms. (about 25 per cent. of the theoretical). The product is pulverised, the powder introduced into an extraction thimble and extracted with ether in a Soxhlet apparatus, until the extract is no longer coloured. Ether removes an unidentified yellow substance. The extraction is then repeated, using absolute methyl alcohol, until the extract shows but a slight pink colouration. Ordinarily a brick-red powder remains in the extraction thimble.

The combined methyl alcohol extracts are then concentrated gradually, and the warm saturated solution is seeded with a few crystals of pure pinaverdol. On very slow cooling, Pv. I. crystallizes in beautiful, metallic needles resembling brass splinters. If the solution contains impurities, is concentrated too far, or is cooled too rapidly, the dye shows a tendency to crystallize out suddenly in fine, blue-black needles. In this form the dye is less pure than that obtained on slow crystallization.

The yields of pure dye are invariably low, the highest yield being about 3 gms. (13 to 14 per cent. of the theoretical amount).

Calculated for $C_{33}H_{31}N_2I$: I = 28.9 per cent. Found : I = 28.95 per cent., 28.95 per cent., 29.04 per cent.

The foregoing procedure presents only a slight modification of that outlined in the German patent[4].

The following method for the preparation of Pv. I. is still more convenient, in that it yields a pure product without the tedious extraction with ether and methyl alcohol :—

Fourteen grams of the toluquinaldine methiodide and 25.8 gms. of quinoline methiodide (anhydrous) are dissolved in 400 ccs. hot absolute methyl alcohol. The solution is heated to boiling in a beaker and 90 ccs. of 0.55 *N* solution of sodium methylate in methyl alcohol are very gradually added to the mixture, which is then slowly evaporated to about 4/5 of its initial volume. The hot solution is then transferred to an Erlenmeyer flask and seeded with a few crystals of pure Pv. I. The flask is then loosely stoppered and the solution permitted to cool very gradually. Within 24 hours the bottom of the flask becomes coated with the characteristic brassy crystals of Pv. I., from which the mother liquor may be decanted. The crystals can be freed from the adhering solution by washing first with methyl alcohol-ether mixtures, and finally with ether alone. Further concentration of the mother liquors may yield additional small amounts of Pv. I. The total yield is about 12 per cent. of the calculated amount. Spectrometer readings show that the product obtained by this method is identical with the German pinaverdol, and a colorimetric comparison of the alcoholic solution of both the German pinaverdol and our product indicates that the dyes are of the same order of purity.

The following data are taken from the detailed account of the crystallographic and optical properties of Pv. I., published by Dr. Edgar T. Wherry[5] :—

Crystal system : monoclinic, $a : b : c = 1.1014 : 1 : 1.6053$, $\beta = 88° 20'$. Habit : (see Fig. 1) usually prismatic unit prism and small clinopinacoid), terminated by large faces of the two orthodomes;

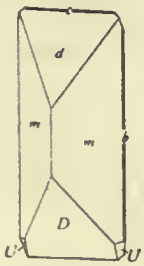


Fig. 1. Crystal form of Pv. 1; m = unit prism (110); b = clinopinacoid (010); d = + orthodome (101); D = − orthodome ($\bar{1}01$); c = base (001); U = − unit pyramid ($\bar{1}11$).

frequently showing small faces of the base, negative unit pyramid and unit clinodome; and occasionally other forms.

Metallic reflection : from faces in the prism zone, brass-yellow; from unit domes and pyramids, beetle-green; from base and faces adjacent to it, bronze-violet.

Optical properties : transparent for white light only in very thin crystals, but red light is transmitted by thicker ones. (For study by the immersion method aqueous liquids must be used.) Refractive indices only roughly determinable; for $\lambda = 0.625$, $\alpha = 1.6$, and $\gamma = 1.8$. Extinction, in the acute angle β, 5°. Pleochroism strong, violet-brown to deep greenish brown.

Pc. IX. (Pinacyanol or Sensitol Red).—A solution of 90 gms. of quinaldine ethiodide and 85.5 gms. of quinoline ethiodide in 3,000 ccs. of 95 per cent. alcohol is heated to boiling under a reflux condenser in a large, round-bottom flask. When the air in the flask has been completely displaced by alcohol vapour, a freshly prepared mixture of 90 ccs. of 16 per cent. (aqueous) sodium hydroxide solution and 60 ccs. of formaline solution (40 per cent. formaldehyde) is poured through the condenser into the flask, care being taken not to chill the reaction mixture far below its boiling point. After the addition, the colour of the alcoholic solution changes rapidly from yellow to purplish blue. Six hundred ccs. of hot water are then added to the mixture, which is rapidly heated to boiling, and maintained at its boiling point for about 15 minutes. On slow cooling, a mass of lustrous blue-green needles is deposited from the solution. The product is filtered on a Buchner funnel and washed with small successive portions of ice-cold alcohol, and finally with ether. Since further concentration of the mother liquor is unprofitable, the dark red filtrate is discarded. The yields of dye obtained by the above method vary from 23 to 27 gms.

Calculated for $C_{33}H_{27}N_2I$: I = 26.35 per cent.

Calculated for $C_{34}H_{33}N_2I$: I = 27.14 per cent.

Found : I = 26.27 per cent., 26.55 per cent.

Found in a sample of British sensitol red : I = 26.7 per cent.

The product is fairly soluble in hot alcohol, yielding a purplish blue solution. It is very nearly insoluble in water.

From absorption data and the results of photo-sensitization experiments, further purification of the dye appears to be unnecessary. Absorption curves indicate that our dye is identical with samples of the German (Hoechst) and the British (Ilford) product.

The above procedure for the syntheses of Pc. IX. is very satisfactory. The only precaution that need be emphasised is that air

[4] Pinaverdol, D. R. P. No. 167,159, Example 1 (1903); Pinacyanol, D. R. P. No. 172,118, Example 1 (1906).

[5] *J. Wash. Acad. Sci.*

should be excluded (as far as possible) from the alcoholic solution of the ethiodides prior to the addition of the alkaline formaldehyde solution. Air, in the presence of alkali, causes the formation of red isocyanine dyes, which undoubtedly appear in the mother liquors from Pc. IX.

Although quinoline ethiodide is one of the re-agents used in the above procedure, we have no direct evidence that it is involved in the reaction forming the dye. When this quaternary halide is *omitted* from the reaction mixture, and a corresponding weight of potassium iodide added, a dye which we have termed Pc. X is formed. This dye resembles Pc. IX. very closely, and may be identical with it. In this case, however, the crude product requires further purification, and the yield is disappointing.

Pc. X. is prepared as follows : A solution of 90 gms. quinaldine ethiodide in 3,000 ccs. of alcohol is heated to boiling under a reflux condenser. Precautions are taken to exclude air. A mixture of 52 ccs. of 15 per cent. sodium hydroxide solution (= ⊂ = 45 ccs. of 16 per cent. sodium hydroxide solution) and 60 ccs. of 40 per cent. formaldehyde solution is then run into the boiling mixture, to which is subsequently added 600 ccs. of an aqueous 10 per cent. potassium iodide solution. The mixture is then boiled for about 20 minutes. On cooling, 21 gms. of a greenish black crystalline product is obtained, which, after two recrystallizations from 70 per cent. alcohol (containing small amounts of potassium iodide), is obtained in the form of shimmering, green needles. The yield is about 8 gms.

Calculated for $C_{25}H_{27}N_2I$: I = 26.35 per cent. Found : I = 26.84 per cent.

Whether or not Pc. X. is identical with Pc. IX. is still undetermined. Its absorption spectrum is certainly very nearly identical with that of Pc. IX., and its sensitising power is practically the same as that of Pc. IX.

Pc. XII. (Chloride Corresponding to Pinacyanol).—Pc. IX. may be quantitatively converted into the corresponding chloride (Pc. XII.) by the following treatment :—2.41 gms. (1/200 mole) of Pc. IX. are dissolved in 25 ccs. of cold concentrated hydrochloric acid, and the solution is slowly poured into an Erlenmeyer flask containing 2.2 gms. of freshly-prepared silver chloride suspended in 25 ccs. of concentrated hydrochloric acid. The mixture is shaken thoroughly for several minutes, after which four to five volumes of water are added. The solution turns blue, and a finely divided precipitate of silver chloride is formed. The latter is filtered off, and the filtrate rendered very faintly alkaline with aqueous potassium hydroxide. The treatment precipitates the dye (Pc. XII.) in the form of dark blue sludge. The product is washed with water on the centrifuge until the washings are neutral to litmus, and is then filtered. Without separating it from the filter paper, the crude dye is transferred to a 300 ccs. flask and extracted (under a reflux condenser) with 150 ccs. of 80 per cent. ethyl alcohol. The hot alcoholic solution is filtered, and on cooling very slowly the dye crystallizes in the form of flat, blue-green needles, which show a tendency to mat together. Careful concentration of the mother liquor yields two additional crops of the chloride. The total yield of the dye is about 1.8 gm.

Calculated for $C_{25}H_{27}N_2Cl$: Cl = 9.07 per cent. Found : Cl = 8.33 per cent.

Both analysis and absorption data indicate that the compound contains water of hydration or alcohol of crystallization, but this point has not been settled.

Reports from the Bureau of Standards and from the Ansco Research Laboratories indicate that the chloride (Pc. XII.), because of its solubility, possesses marked practical advantages as a photosensitizer over the corresponding iodide (Pc. IX.).

Absorption Spectra.—The spectro-photometric measurements were made with a König, Martens, and Grünbaum spectro-photometer. The dyes were studied in 95 per cent. alcohol solution in a cell 1 cm. thick against a similar cell containing solvent alone. The concentrations of solution used were 0.01 gm. per litre, or 0.005 gm. per litre, according to the maximum absorbing power of the substance.

Louis E. Wise.
Elliot Q. Adams.
J. K. Stewart.
Carl H. Lund.

Correspondence.

THE BUTLER THREE-COLOUR CAMERA.

To the Editors.

Gentlemen,—I note in reading Lieut. H. E. Rendall's "Review of Colour Photography" in the "B.J." of August 1, in making reference to No. 5 camera of the series—viz., Butler's one-exposure tricolour camera—that he was given to understand registration was a sort point with this camera.

May I assure him that it was, but it was my difficulty, not the users' of the cameras. It was a difficulty which I successfully overcame years ago in the work of its adjustment.

Numerous prints have been made showing no lack of register even when enlarged three or four diameters from the negatives taken by my camera, which I should be pleased to show to Lieut. Rendall if expedient.

Herewith I enclose two samples of three-colour block enlargements from my camera negatives. With regard to the speed, I took several sets of landscape negatives recently, using Ilford's Special Rapid Panchromatic plates, and secured fully exposed good results by ½ sec. exposures. For copies of oil paintings, etc., by interior light, the exposures extended to 2 mins.

The belief that Lieut. Rendall would welcome the correction of a mistaken impression, is my apology for troubling you with this letter.—I am, dear Sirs, yours faithfully,

Edwin T. Butler.

26, Craven Park, Willesden, N.W.10, Augus 29.

[The proofs sent by Mr. Butler, one of which is a leafless tree subject, show excellent registration. We understand they represent three or four times enlargement of the original negatives.—Eds. "Colour Photography" Supplement.]

IS THREE-COLOUR A BLIND ALLEY?

To the Editors.

Gentlemen,—I am sure we are all indebted to Mr. Rendall for his review of colour-photography, and share his regret that we cannot yet show good prints on paper.

But I should like to warn beginners against taking up the work just where it was left when the war broke out; if we are beginning afresh, let it be really a fresh start.

It is quite a false assumption to think that, having got three perfect colour-selection negatives, it is only necessary to choose a good colour-printing process, superimpose the three images, and the thing is done, and that all further trouble is the fault of the printing process.

It is not so. Rather it is we who are imposed upon; for in Nature the colour, however tertiary, is reflected, atom by atom, direct to the eye.

No matter how pure the colour or dye employed, there is always a certain amount of opacity in the three superimposed images, and if they are placed in order—yellow, red, blue—then the rays or pencils of light have to pierce the blue and red to reach the yellow, and, reflecting back from the paper, struggle once more through the intervening images to bring the yellow colour to the eye.

When—throwing theory overboard—we reduce the red and blue images, a lot of fine detail is lost; we may have got some sort of balance, but the result is like nothing in Nature. The natural colour photograph must be composed as one homogeneous whole if it is to be really natural.

Therefore, I propose that we cut the losses of the years spent in trying these "indirect" methods, and return to the "direct."

About 1870, Poitevin and several German experimental workers had got results of some sort by direct means, and probably dropped further work in that direction when the three selective colour, or "indirect," method came in and promised to be such a success.

A short résumé of where we stand in "direct" methods should be very helpful just now, when it seems easier to keep on in the old way, which I feel convinced is a "blind alley."—Yours faithfully,

S. G. Yerbury.

Dunstable, August 11.

No. 155. VOL. XII. OCTOBER 3, 1919.

THE BRITISH JOURNAL OF PHOTOGRAPHY

MONTHLY SUPPLEMENT

ON

Colour Photography.

CONTENTS.

	PAGE
A Simplified Method of Developing Autochrome Plates. By A. and L. Lumiere and A. Seyewetz	37
Two-Colour Prints or Films by Copper and Iron Toning	38
Correspondence: Three-Colour Photography	39

A SIMPLIFIED METHOD OF DEVELOPING AUTOCHROME PLATES.

Some years ago we published a method of developing Autochrome plates, according to which the observation of the time required for the appearance of the first outlines of the image in a suitably diluted developer served as an indication of the correctness of the exposure of the plate, or whether it had been over-exposed or under-exposed, and also enabled the user to determine the time during which the plate should be developed in a solution to which an addition of concentrated developer had been made in order to obtain a good result.

This variable time of development, which is determined by the time of appearance of the first outlines of the image, is given in a table which we worked out by a series of practical tests made on plates which had received various degrees of exposure—under, over, and correct.

The method yields very good results, and allows of a very satisfactory transparency being obtained with a plate which has been exposed as much as four times the normal time. In use, however, it has the disadvantage of requiring the table of figures, prepared as a transparency, to be read by the dull light of the dark-room, a condition which is liable to give rise to mistakes.

An amateur worker, M. Meugniot, has communicated to us a method of working which is simpler than that we had indicated. It consists in bringing up the first outlines of the image always in a dilute developer, but this dilution is so adjusted that, in subsequently continuing development in a more concentrated developer, the times of immersion in these two successive developers shall be equal. We have adjusted the degree of dilution of the developers to be employed according to this new system, so that exactly the same quantity of developer is used as in the former method.

The system of working which gives the best results is as follows:—

Developing solutions. The stock solution is that which has hitherto been used—viz.:—

Metoquinone	15 gms.
Soda sulphite, anhydrous	100 gms.
Potassium bromide	6 gms.
Ammonia, 22 deg. B (sp. gr. .923)	32 ccs.
Water	1,000 ccs.

For a 9 x 12 cm. plate in a 9 x 12 dish two solutions are made up from this stock solution:—

Solution A.

Stock solution	10 ccs.
Water	15 ccs.

Solution B.

Solution A	2 ccs.
Water	30 ccs.

The plate is immersed in the B solution, observing all the necessary precautions for the development of the Autochrome plate.

The time of appearance, from the moment of immersing the plate in the developer, of the first outlines of the image, not reckoning the sky, is noted either with a stop-watch or a sand-glass.

As soon as the first outlines of the image appear, solution B is poured off and replaced by the portion left of solution A—namely, 23ccs. Development is then done for exactly the same length of time as was required for the image to appear in the first developing solution.

When using a sand-glass, it is sufficient, as soon as the first outlines of the image have appeared, to stop the passage of the sand by laying the glass in a horizontal position and then placing it vertical again, but the other way up, in front of the dark-room lamp. In this way the sand-glass indicates a second period of time exactly equal to the first.

The remaining operations, reversal and re-development, are done in the usual way.

We have developed by this method a number of Autochrome plates which have received exposures ranging from one to four times that of correct exposure, and have obtained in all cases as good results as by our former method.

This new system of development appears worthy of being brought to the notice of Autochrome workers on account of its great simplicity and the excellent results which it yields.

A. and L. Lumiere.
A. Seyewetz.

TWO-COLOUR PRINTS OR FILMS BY COPPER AND IRON TONING.

[Details are given in a recent patent specification, No. 119,854, of a method of producing two-colour prints or films worked out by Mr. F. E. Ives, in which the essential feature is the combination of a red copper-toned silver image with a blue-green image, the latter preferably formed by toning with iron salts. The specific claims made in respect to the process and product are given in "Patent News" on another page.—Eds. "Colour Photography" Supplement.]

The object of the invention is to afford a simple, effective, and convenient mode of producing a multicolour picture or print, and one which, compared with hitherto known processes, will be less complicated and quicker to carry out, and will yield a better product, having superior and more permanent colouring. It relates particularly to the known type of process in which at least two differently coloured images are successively produced in or on the same carrier, whereby the necessity of attaching independently produced supports is obviated. The invention could, for instance, be applied to the production of the images at the opposite exterior faces of the support, which may be of gelatine or other colloid, with preferably a celluloid core or base between the exterior faces; but it has the advantage of being equally applicable to the production of the images within, and at different surfaces, of a single colloid layer at one side of a transparent or celluloid carrier. As the product has one face free from any image-carrying layer, the method of production last referred to is peculiarly adaptable for use in the production of a colour motion picture film free from liability to injurious defacement of the pictures.

For the purpose of describing one embodiment of the invention it is assumed that two or more simultaneously exposed views or series of views have already been taken from substantially a single view-point for securing colour-selection negatives from which afterwards the positives or diapositives are to be made. The two-colour system is supposed to be employed, for, although the three-colour system might be used, the two-colour is eminently more simple and is sufficiently satisfactory for general practical purposes.

In exposing for taking the view or series of views, a red screen may be interposed in the path of the light-rays, or in some other way a selection of the red rays may be made, and in connection therewith a film sensitised specially for red rays may be employed. Thus red-selection negatives are obtained. Similarly a green screen and green-sensitive film may be employed for securing green-selection negatives.

It has been proposed to produce in a single gelatine layer an insoluble colour image such as a silver image toned by well-known methods, or an iron-blue image, and subsequently to add a second image of a different colour, either consisting of a soluble dye introduced into the gelatine layer by absorption, or produced by sensitisation of the image-containing layer with iron salts, printing, and developing. The present invention constitutes an improvement on this method and eliminates disadvantages in production, and defects in the product, by applying a particular treatment, not heretofore adopted in this connection, for the toned silver print and by employing this particular treatment in connection with the location of the two images in or on different surfaces of the same carrier. Such location *per se* is, however, already known, it having been proposed to produce a toned silver image by exposing a sensitive layer from one side and to produce in the same layer a dye image from a silver image made by exposing the layer from the opposite side without resensitising.

The invention, in its application to the two-colour system, may conveniently be carried out in the following manner. Assuming that the negative 10 represents the green components of the picture, and the negative 11 the red components, eventually the final picture will include a blue or green positive image from the red-representing negative, and a red positive image from the green-representing negative.

One of the two negatives 10 or 11 is preferably a reversed negative; for example, the green-representing negative 10, which may be used for rear exposure through the carrier of the print, as is hereinafter described.

The print or film 12, in which the positive images are to be formed and blended, comprises a colloid portion or layer 13, supported on a transparent or celluloid carrier 14. The carrier

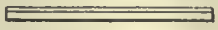


Fig. 1.

Fig. 2.

Fig. 3.

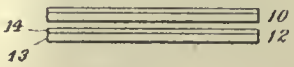


Fig. 4.

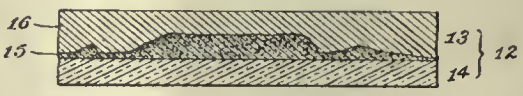


Fig. 5.

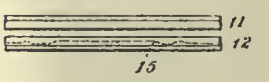


Fig. 6.

Fig. 7.

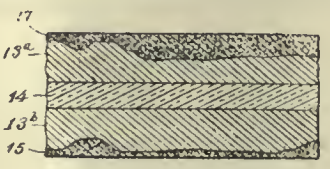


Fig. 8.

14 may have a colloid layer 13 on each side, but it suffices to employ a single colloid layer on one side thereof, since in the preferred embodiment both of the positive images are formed in the single layer.

The first step in the process is to expose by means of one of the negatives, and form an image at one surface of the colloid portion of the print or film 12. It is to be assumed that the colloid layer 13 is sensitised with silver haloid. The first printing is preferably by the green-representing negative 10, and, as shown in Fig. 4, this negative is used to effect the exposure at the rear or through the carrier 14, so that the resulting image will be confined largely to that side of the

gelatine layer which is next to its carrier, and may be referred to as the bottom or interior surface. The negative 10 will preferably be a reversed negative, as before stated.

The procedure of making the first or silver image might in some cases be reversed by making it at the exterior or top surface of the gelatine, and subsequently making the complementary image at the interior surface; but the first-mentioned procedure is better, simpler, and is the preferred embodiment.

Having been exposed, the silver image may be developed, and will be found confined to the interior surface of the gelatine in manner that will be roughly understood from the enlarged cross-section Fig. 5, in which the colloid layer 13 is shown as having the silver image 15 at its bottom side with a mass of clear gelatine 16 extending between the image and the top surface.

This silver or bottom image, it will be understood, is a black and clear image, but according to the invention it is subsequently colour-toned, preferably to a red colour. This colour-toning may be performed subsequently to the exposure and printing for the second or blue-to-green image, although, as described, the exposure for the red or bottom image is performed prior to the exposure for the blue-to-green or top image.

After the silver image 15 is developed, the gelatine layer may be easily re-sensitised for exposure at its exterior surface. A convenient mode for producing the blue-to-green image is the iron process. The colloid layer may be subjected to a 2 per cent. bath of green citrate of iron and ammonia with an immersion of about five minutes, followed by blotting off and drying.

The top or exterior surface of the gelatine may now be printed by means of the red-representing negative 11, which, of course, is to be accurately registered with the silver image already formed. This printing step is indicated in Fig. 6. After exposure the iron-salt print is converted into a cyanotype blue-print by development with a 1 per cent. solution of potassium ferricyanide applied for about ten seconds, and then immediately washed out again.

There is now an insoluble silver image at one side and an insoluble blue-to-green image at the opposite side of the colloid layer 13. The latter may be described as a pigment image to distinguish it from a water soluble dye, the former being insoluble and not liable to wash out in subsequent steps.

The silver image is next converted into an insoluble or pigment image of red colour by the following means. The image is first converted into copper ferrocyanide by soaking in a copper toning bath for a period of from fifteen to sixty minutes, this bath being prepared as needed, by mixing equal parts of the two following stock solutions A and B:—

A	Copper sulphate	7 gms.
	Potassium citrate	28 gms.
	Water	1,000 c.c.s.
B	Potassium ferricyanide	6 gms.
	Potassium citrate	28 gms.
	Water	1,000 c.c.s.

This converted image may be fixed in a bath of hypo, which leaves a transparent copper red image, which, with the therewith blended cyanotype blue-print, gives approximately what is required under the two-colour process; but the fixing out in hypo may sometimes be advantageously omitted.

The blue-to-green or exterior image is indicated at 17 in Fig. 7, it being for the most part completely separated from the interior image 15 by the clear gelatine 16, but possibly, owing to extreme depth of both images at one point, the two may overlap, as indicated at 18, without, however, any material effect upon the process or product.

An important advantage of the invention is its flexibility, permitting a considerable latitude of modification of colour components. A satisfactory print is obtainable when the silver image is copper-toned prior to the iron sensitization for the cyanotype print. With this process the blue print can be modified to a greener hue by treatment with extremely dilute potassium bichromate solution rendered slightly acid with sulphuric acid; while, if considered necessary, the copper red print also can then be intensified or modified in hue by mordant dyeing. While a third colour could be added as heretofore proposed, the complications attendant on this render the two-colour system commercially important, notwithstanding that the exhibited colours will be only approximately accurate representations of the original. It is this approximation of colour, and additionally the desire of the motion picture artist to secure certain colour tones or effects, which render the flexibility of the process and adaptability to colour modification important for the purposes of the invention.

While it is preferred not to place the two images at opposite sides of the celluloid carrier, this if done would be performed, as previously described, by first producing the red print in the colloid at one side through exposure for the silver image and subsequent copper toning, and at the opposite side sensitising the other colloid coating and exposing for the blue-to-green image after the exposure of the silver salt.

The product of this invention in its preferred form is a colour photograph or film comprising colloid material containing a red copper toned silver image blended with a blue-to-green image; the two images being in different portions of the colloid, preferably at opposite sides of a single layer.

In the Fig. 8 modification where the colloid consists of two layers 13a and 13b on either side of the core or carrier 14, the first exposed and developed image 15 will be understood to be the silver image which is to be converted to a red colour, located in the colloid layer say 13b, while the subsequently exposed image 17, which may be a cyanotype print, is in the opposite colloid layer say 13a.

Correspondence.

**** Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

**** We do not undertake responsibility for the opinions expressed by our correspondents.*

THREE-COLOUR PHOTOGRAPHY.

To the Editors.

Gentlemen,—Mr. S. G. Yerbury's able letter and query, "Is Three-Colour a Blind Alley?" in the "B.J." of September 5, concerning Lieut. H. E. Rendall's "Review of Colour Photography" in the "B.J." of August 1 and September 5, claims the attention of many earnest workers interested in the evolution of colour photography, particularly now that the war is at an end, with opportunities of progress again possible.

Many experts will quite agree with Mr. Yerbury that now is the time to make "a really fresh start" in colour photography. Surely all experienced workers in tri-colour must now conclude something is radically wrong with the whole subject, as promoted commercially by various scientists during the past few years. Negatives have to be faked, fine-etching employed upon half-tone blocks, and, generally, printing in colour photography seems almost a farce, by reason of so much hand work and artifice being necessary before even fairly good colour prints by photographic means can be produced. These scientists generally trace the cause of failure in photographic colour printing to imperfections in the printing inks employed; but this assertion almost appears a libel upon the ink manufacturers if we consider the beautiful colour prints produced in the past by chromo lithography, twelve to twenty various coloured ink impressions being superimposed in printing with marked success.

Yes, a really fresh start is now necessary. But this new departure must be made by amending past proved errors, and supplementing tri-colour photography, not by "scrapping" the whole subject as "a blind alley," according to the conviction of Mr. Yerbury.

In the first place, a return must be made to the first principles

of colour, particularly in the making of colour filters, as realised by artists since the Renaissance, and as so accurately described by Ducos du Hauron (the inventor of tri-colour photography) in his master patent specification No. 2973. of 1876. There he states: "I obtain separately in the camera three impressions, three negatives of the same subject, furnished by three different lights—green light, orange light, and violet light. I make the red monochrome under the negative which is given by the green light, the monochrome blue under the negative given by the orange light, the monochrome yellow under the negative from the violet light. The superposition of the three monochromes, adapted mechanically the one to the other and placed on a white ground, produce the composition, the polychromatic image, desired."

N.B.—In this specification the lights, or filters, are the secondary colours—green, orange, and violet—of the artist, and are complementary to the three primary colours—red, blue, and yellow—which all experts now know in hue as necessary for producing all other colours in printing, with one exception. This exception is a vivid green, such as emerald green or viridian, which no combination of blue and yellow printing ink, dye, or other pigment can properly reproduce. For the present, explanation and consideration of this vivid green as a primary colour in painting or printing must be deferred. Obviously, the phenomena connected with reflected light, as visually perceptible by daylight, of colours upon white paper, chiefly claim present attention, to the exclusion of considering phenomena concerning coloured projected light, or transmitted light as seen through coloured transparencies.

In the B.J. "Colour Supplement" of 1912, pages 43 and 55, I insisted upon the necessity of a fourth grey key printer, in conjunction with correct tri-colour impressions, for the production of good colour photographic prints. With seven years' increased experience, I am absolutely convinced of the truth of my contention. When contemplated under any aspect, nature conveys to the trained artist's visual sense a wonderful range of tones in grey, from pure white down to dense black, in combination with colour. It is this subtle union of greys with colour which form the substantial beauty of all real art work. No three colours alone, whatever the printing inks or colours may be, can adequately reproduce the true delicacy or powerful luminosities in subtle grey tones from light to dark, observable in nature, unless assisted by this fourth grey key printer.

Pardon reiteration. Probably all terrestrial material nature is wholly black-like in the absence of solar light, with the exception of phenomena connected with phosphorescence. This general black-like aspect of material things, when illuminated by daylight, will absorb in part, and repel in part, various colour portions of the light in accordance with the innate characteristics of the various things contemplated. The repelled colour parts of light are transmitted to our sight to constitute an actual colour impression of the thing seen; but invariably, in conjunction with colour, residues of the original black-like aspect of the material objects observed, changed by light into greys of various luminosities or tones, are also transmitted and received as visual impressions, assisting the effect of the light and shade in nature. The anatomical parts of the eye harmonise with my contention. Why are the nerve terminals of the retina, which receive all our visual perceptions of nature, made up as a fine delicate mosaic of two totally different nerve structures, known as rods and cones, unless for seeing nature in a combined dual manner? Moreover, in that excellent comprehensive text-book by G. L. Johnson, "Photography in Colours," 1914 edition, plate IV., page 51, a case is described and illustrated in colour of a paralytic patient, colour-blind in the left eye and of normal colour vision in the right eye, who made two colour drawings of the spectrum, viewed through a spectroscope, according to his visual perceptions by each eye. If we may judge correctly by the two facsimile coloured illustrations thus depicted, this patient reproduced the spectrum, by various shades of grey from white to black, quite devoid of any colour, as seen by the colour-blind left eye. This fact establishes a proof that the human eye is capable of perceiving a perfect monochrome grey visual impression of various light-luminosities, completely separate from any colour impression, where the anatomical structure of the eye for colour has been destroyed by paralysis. His reproduction of the spectrum, as seen by the normal colour-vision right eye, was quite correct in colour according to human eyesight, establishing another proof that true mental impressions of vision depend upon perfect anatomical parts.

If the case for amending and supplementing tri-colour photography has been correctly stated, then the need is obvious for changing and adapting parts of apparatus in present use, according to suggestions made, particularly in reference to colour filters. A one-exposure camera, for the various negatives necessary in colour photography by the subtractive method of printing, is an essential requisite for proper production. If Mr. Butler can include a grey key negative printer, and also a special green printer with the ordinary tri-colour negative, made by his one-exposure camera, he would probably greatly assist proposed developments, as the negatives made by this camera are generally in true register.

E. G. Handel-Lucas.

Colour Screen-Plate Hints.—Many photographers who have had but little experience with the screen-plate processes of colour photography complain of the lack of brilliancy of the colours in the deeper and more poorly lighted portions of the subject in the resulting transparency. The explanation of this is simple. The colours are not there in sufficient brilliance in order for them to be properly rendered in the picture. In proof of this let us take a simple example. A laurel bush is viewed somewhat against the light. The best lighted portions of the bush will be found to be brilliant and strong in colour, but those receiving no direct sunlight will be found to lack colour. The colours exist we know, but they require a full and brilliant lighting in order to bring them into full prominence. As a general rule, against-the-light pictures are unsuccessful as colour subjects, as also are poorly lighted woodland subjects, and the photographer must realise that in order to get a good result an equal and uniform lighting is to be desired.

Too little attention is often paid by colour photographers working the screen-plate processes towards giving a correct exposure. In my own experience most of the failures with both the Autochrome and Paget processes may be traced to this cause. Exactitude, both in calculating with the aid of the meter and in timing the indicated exposure, is more essential in colour work than in any other branch of photography, since any error, even if only of a minor degree, is almost certain to falsify both the colour rendering and the contrasts of the final result. When calculating the exposure a meter should always be used that makes an actual test of the actinic value of the light, instead of a calculator, or table working upon certain factors, assessed for the most part by guesswork. Great care must also be taken to ensure that the meter is held in the proper way, in order to give an indication of the strength of the light that illuminates the *deepest* shadow parts of the subject. In colour work any trace of under-exposure, which would prove of little account in ordinary monotone work, and more especially in the case of rather dimly lit shadow detail, is to make the production of a perfect result impossible.

In the case of the Autochrome process, correct exposure is more essential than that of the Paget, since with the latter slight inaccuracies of the negative may be compensated for to a certain extent when making the transparency, though this plan is at the best a makeshift, and not to be recommended. With the former process under-exposure gives a very thin negative. Upon reversal the image is, as a rule, over dense, and it may be that the colours are falsified. On the contrary, over-exposure giving a dense negative, the positive may be too thin. Thus it will be seen that the secret of success is a carefully calculated exposure. Of course, there are modifications that may be employed in order to correct the results of under- or over-exposure, but their use does not produce the fine results that accrue from the course recommended above.

In the case of the Paget process, the plate upon which the negative is taken being a panchromatic the best results will only be obtained if the exposure is decidedly on the full side. We have found that any great under-exposure produces false colours; in fact, it is far better to over- than under-expose. When the subject contains extremes of contrast, as in the case of a woodland scene in sunlight, the only safe way is to expose fully for the shadows and to rely upon a careful development with a fairly dilute solution. A long experience of this process confirms my opinion that most of the failures met with by photographers may be traced to carelessness in giving the exposure.—R. M. Fanstone.

No. 156. VOL. XII. NOVEMBER 7, 1919.

THE BRITISH JOURNAL OF PHOTOGRAPHY

MONTHLY SUPPLEMENT

ON

Colour Photography.

CONTENTS.

	PAGE
Essential Features in Apparatus for Colour Photography By Robert Fenstone	41
Three-Colour Sensitive Units for Colour Photography	43
Correspondence:—	
Three-Colour Photography	44
News and Notes	44

ESSENTIAL FEATURES IN APPARATUS FOR COLOUR PHOTOGRAPHY.

Many beginners in colour photography are inclined to pay far too little attention to features desirable in their apparatus, and though the manufacturers of the materials used for various methods frequently state that any ordinary camera may be used, the process itself will be facilitated, and success assured if the photographer carefully examines his apparatus, with a view to its modification, if this is needed, according to the peculiarities of the particular process that he intends to work. I hope, by stating what is desirable in the way of apparatus, to forewarn the beginner against possible pitfalls, and also to assist the advanced worker who is not getting results as good as he desires.

With regard to the camera itself, I have found nothing so suitable as the ordinary field outfit, and its most desirable feature is rigidity. Exposures for colour photography, even under the most favourable conditions, are long, and if the outfit is not perfectly firm when set up, trouble on this score is a likely experience. I have found that a camera that has never given any trouble when employed for ordinary out-of-door work, gave badly blurred negatives when used for colour work in the deep shadow of the woodland, when the exposures were very long. Though most generally found upon the modern field camera, the swing-back and front is a great help in colour work by reason of the fact that they facilitate focussing without stopping down. The value of this will be seen later.

The hand camera, even when supported on a tripod, leaves much to be desired in the matter of rigidity, and considering that with all the modern colour processes the best result is only obtained with a full exposure, this is hardly in its favour. Of course, I do not mean to infer that good results cannot be obtained with any but a field camera, but merely as experience has shown me to indicate what is best. Snapshot exposures, with the camera held in the hand are impossible except under the most favourable conditions.

A shutter is not to be regarded as essential, and may even give trouble from vibration, if the exposures are very long. I always use the lens cap when the exposure, as it often does, runs into twelve seconds, or more, and find that this is superior for long periods to the best of shutters. In the case of roller-blind shutters, operated by a pneumatic release, reliance cannot be placed on the instrument remaining open for a long period at "bulb," while if used at "time," trouble is apt to arise from vibration when pulling down the blind, to start the exposure; hence my preference for the cap.

While on the subject, it is perhaps as well to point out that the rigidity of the tripod should not be overlooked.

One of the most important points that should engage the attention of the colour photographer is, that his dark-slides should be suitable for the requirements of the particular process that he is working; but I have known many who have overlooked this altogether. Both the Autochrome and Paget processes differ very considerably in their requirements in the matter of dark-slides. With the former process, owing to the extreme delicacy of the surface of the plate (which is exposed glass-side towards the lens), no pressure of springs, or the separating plate of the double slide, may be permitted, or an abrasion of the film is certain to result. On the other hand, when working the Paget process, it is not only most important that there should be springs on the slide, but also that they do their work effectually, in bringing the negative plate into perfect and entirely uniform contact with the taking screen, in order that a perfect dot formation may be secured. Neglect of this, which allows of uneven contact between plate and screen, produces a transparency that is colour correct in portions only, and those working the process should pay every attention to this matter which is one upon which the success of the whole process mainly depends. I prefer, for both Autochrome and Paget colour work, double book-form dark-slides or the American block-form slide, in preference to the single metal pattern, by reason of the fact the double slide allows ample room for the plate. I have used the single metal slides for the Autochrome process, taking great care to prevent abrasions of the plate from the back of the slide. This must be quite free from dents, etc. The single metal slide is not, however, so well adapted for the Paget process, as it is a difficult business to get the two plates into the space only intended for one, unless the screen and plate are upon the specially thin glass issued by the makers for these slides, but even then there is some doubt about securing perfect contact. When carrying Autochromes in double dark-slides, I take out the metal separators and springs and load each slide with two plates, using the special cards

issued by the makers for this purpose, as separators. For the Paget process I use one plate in each slide, owing to the fact that if two exposures were loaded into each slide, the four plates would make a very tight fit when the springs are in position, and these would either tend to crack the plates, or to force the slide apart at the middle. I insert the screen and plate in the slide, taking note which shutter must be drawn for the exposure; upon the back of the plate is laid a piece of dead black card, and on this the springs; the slide is then gently closed, the springs forcing the plates into even contact. Speaking of springs reminds me to mention that the single central spring fitted to the centre of the metal slide divisions, is totally inadequate; my own are made from old pieces of clock-spring, covered with black velvet, in order to prevent their scratching. They are about two inches less in length than the width of the plate for a half-plate, are bent into a slightly concave shape, and placed in position in the slide with the ends resting upon the card separator. They should be about two inches from the top and bottom of the plate. These springs should not be too strong. On one occasion, I unthinkingly used a couple of springs from the back of an old quarter-plate printing frame; they forced the slide apart at the middle, and apart from fogging the particular plate, warped the slide very badly.

It is, perhaps, almost superfluous to add that everything inside the camera and slide should be perfectly dead black. This is far more important in colour work than in the ordinary branches of photography, since reflected light or halation may cause degradation of colour in the finished result.

That the lens is fully colour-corrected is of primary importance for all colour photography, and for this reason experience teaches me to favour one of the modern anastigmats in preference to one of the older R.R. pattern, since these may not be so carefully corrected of chromatic aberration. Another great advantage offered by the anastigmat is, that it will cover the plate sharply to the margins without stopping down, which may be necessary with an R.R. or other lens not having a flat field. Stopping down is to be avoided as much as possible, as this in practice tends to produce results that are devoid of the more subtle gradations. I am inclined for this reason to recommend a lens of fairly short focus for the plate in use, owing to the ease with which a subject in different planes may be focussed sharply at a large aperture. If, however, the photographer does not possess an anastigmat, an R.R. or good large-aperture portrait lens will serve. An important point is that the glasses of the lens itself must be free from any trace of discolouration. It sometimes happens that through the decay of the cementing compound, by reason of damp, improper storage, or other cause, the glasses of some lenses have a decidedly yellow or brown tint, which may upset the carefully adjusted lens-filter. I was once asked why a certain amateur photographer's colour transparencies lacked the brilliant colours that the process was capable of producing, and had instead a brownish tint. After some investigation, the cause was traced to the fact that the lens was a very old and discoloured instrument; indeed, sufficiently so to form quite a serviceable yellow filter, for orthochromatic plates. What has been said in this connection may be taken as applicable to all colour processes, especially to the Autochrome, and Paget, and perhaps in a slightly lesser degree to the making of colour-sensation negatives, for three-colour work. Lenses should never be stopped down below *f*/16.

We have heard little of colour photography with a telephoto lens, and I must confess to having little experience with it, but in the classes of work for which it is designed I can imagine no more valuable tool than one of the large-aperture telephoto lenses with a relatively short back focus such as the "Telecentric" or "Adon." The older telephoto lenses are not so well suited for colour work, by reason of the fact that they work at a small aperture; while their definition, upon which much of the success of the picture depends, is very poor.

The soft-focus lens, owing to the reason that its particular feature is obtained by partial colour correction, is hardly a suitable tool for colour photography, but it is to be hoped that with the advance of the latter a lens of this type may be devised to give us some of the pictorial advantages that it now offers for monotone work.

Of course, only filters suited to the process, as issued by its manufacturer, should be employed. I have found that sometimes these vary in colour, but this will not affect their work, as they are carefully tested before sending out. Preferably, they should be mounted in optically flat glass, and every care taken of them. Experience teaches me that the best place for the filter is between the components of the lens, or if fitted in a cell, slipped over the back combination. There is a reason for this latter course. If the lens has not been perfectly colour-corrected, the filter may prevent any ill-effects from this, but if it were fitted to the front of the lens, such would not be possible. It is most important that no light is allowed to reach the plate, except through the filter, such as would happen if the latter fitted loosely, and this is one objection to the plan of using a thin circle of gelatine between the components of the lens, as it is almost impossible to obtain a perfect fit, and white, or other light reaching the plate other than through the filter causes the colour photograph to be of a blue, or violet tint. When using unmounted gelatine filters, I make a practice of cementing each between two circular pieces of thin black cardboard, with the centres removed, leaving about an eighth of an inch all round to act as a cell, the outer circumference of the cell fitting quite tightly into the lens mount. This also saves spoiling the filter through handling the gelatine surface with hot or damp fingers, which is frequently done. For the Autochrome process a special screen-holder is supplied to fit on the inside of the camera, which should always be used when the camera will permit. With the field camera there is always room on the inside of the front for this, but the compact folding pocket-camera does not always permit of this procedure. The solution of the difficulty lies in having the filter mounted in a well-fitting cell, to slip over the back combination of the lens.

An exposure meter is of great importance if waste is to be avoided and the production of perfect results is to be the rule, and not the exception. I recommend a meter that makes an actual light-test, in preference to one of the published tables, or calculating devices working upon a system of scales to be mentally adjusted by the photographer. Special colour-plate meters may be obtained, but there is really no need for these, though the Watkins Company supply an interchangeable colour dial for their "Bee" meter. This is a great help, and simplifies matters considerably.

Of our old friend, much abused and ill-esteemed, that most of us still cling to—the dark-room lamp, though it may be fitted with a "safe light," I would point out that no light is "safe" for colour plates, and the lamp should be simply used as a means of seeing what is wanted in the room, and in aiding the photographer's sense of touch, and not for the purpose of peering at the developing-plate in its early stages. I use several thicknesses of the safe-light paper issued by the makers of the particular plates that I happen to be working, cemented between two pieces of plain glass with a solution of Canada balsam, and bound up with lantern-slide binding-strips. This fits into the dark-room lamp in place of the usual screen. It is to be noted that for powerful illuminants a greater number of sheets must be used than may with safety be employed with a candle.

ROBERT M. FANSTONE.

THREE-COLOUR SENSITIVE UNITS FOR COLOUR PHOTOGRAPHY

[The idea of producing a sensitive material all ready for use in the making of colour photographs is one which evidently still occupies the minds of inventors, although it may be thought unlikely that anything more practical for the purpose than Mr. Ives's Hiblock system is likely to be devised. A Danish experimenter, Jens Herman Christensen, whose name is associated with other inventions in colour photography, has recently been granted a patent for a system of this kind. For the sake of completeness in our records of these introductions we give below extracts from the patent specification, No. 128,781, although it is by no means sufficiently clear to us as to precisely how a three-colour composite photograph is produced according to the directions given.—EDS. "Colour Photography" Supplement.]

THE invention provides a process of producing a coloured picture by sticking together two supports carrying three coloured films which have been produced by exposure of selective colour sensitive films followed by development, and the images coloured, one of the supports carrying two of three films constituting the parts of the picture, and the other carrying the third film; and the method consists in mounting before exposure at least one of the two supports in a frame, where it remains during chemical treatment and drying, and from which it is removed only after having been stuck to the other support. In some cases the frame can be retained after the supports are stuck together so as to form a frame for the picture. In such a case the coated support and the frame are supplied as a unit by the manufacturer.

The object of using such frames is to prevent the supports and films from contracting or from being displaced during the various steps of the process, and to secure an automatic and complete registering of the images.

Two frames can be used, for example, in the following manner:—

A support consisting of a thin collodion film is coated on one side with a film of collodio-bromide and collodio-chloride emulsion with good contrasts and containing a yellow screen dye (for instance, so-called filter-yellow), and on the other side with a green-sensitive emulsion which may contain a red screen-dye. A second support consisting of a piece of paper is provided on one side with a red-sensitive emulsion.

In the drawings the double frame shown in Figs. 1 and 2 comprises frame-pieces *a* and *c* connected by hinges *b*, and secured when

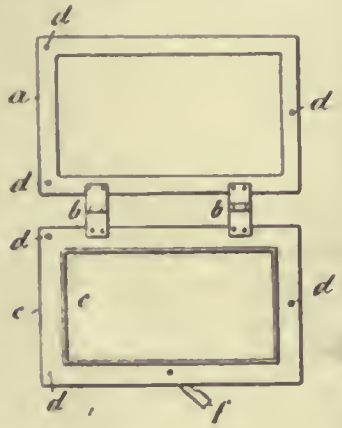


Fig. 1.

Fig. 2.

closed by a clip *f*, or some other suitable means. The frame-piece *c* has a protruding part or edge *e* as shown, and both of the frame-pieces have holes *d* for registering pins.

The double frame shown in Figs. 3 and 4 comprises two flat frame-pieces *g* and *h*, connected by hinges *k* and secured in the closed position by a clip *o*. The edge *e* protrudes from the frame *c* at least as far as the thickness of the frame-pieces *a* and *g*. The frame-piece *g* has holes *m*, and the frame-piece *h* registering pins *n*, as shown. The sides of the frame-piece *h* are preferably somewhat broader than those of the frame-piece *g*.

When the process is to be carried out, the paper *p*, Fig. 5, is fixed between the parts of the frame shown in Figs. 1 and 2 so that it is stretched over the edge *e* and with the coated side upwards, and the edges of the paper are squeezed between the frame-pieces. The collodion film *q*, Fig. 5, coated on both sides, is held flat between the frame-pieces *g* and *h*, the yellow film being turned towards the frame-piece *h*. These operations must be done under a ruby light, and in some cases in darkness. The two double frames are now laid together, the pins *n* being registered in the holes *d* so that the two films are in close contact, as illustrated in Fig. 5. The exposure can now be effected either in a camera or by contact printing with a coloured picture, which is laid on the film *q* in the frame-piece *h*. After the exposure the two frames are separated and the films are developed and treated further while supported in their frames. The pictures may, for example, be converted into silver-iodide prints and coloured with suitable dyes. The frame-pieces *g* and *h* in connection with the film form flat trays into which the solution of the dye can be poured, one side being coloured at a time, each with its own dye. The frame with the film may also be arranged as a partition in a suitable container, and both sides may be coloured at the same time. After colouring, and in some cases fixation and washing out of the films, they are dried, always remaining in their frames, and after drying the paper is provided on its image-bearing side with adhesive and the film is applied thereto, the frames being put together again as shown in Fig. 5, and the film and paper pressed together. As an adhesive, glycerine or other substance which will not soften the films may be used.

If the paper used has a considerable thickness it may be necessary in order to facilitate the mounting in the frame to cut off the corners, and by folding the edges to impart to it folds or bends corresponding to the size of the frame.

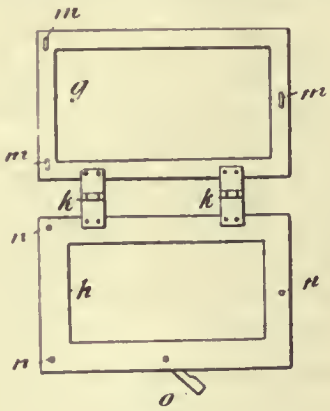


Fig. 3.

Fig. 4.

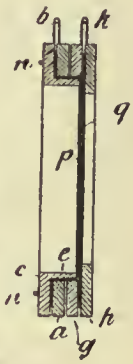


Fig. 5.

If it is desired to produce a transparent coloured picture the paper must be replaced by a glass or celluloid plate, which in most cases need not be mounted in a frame. In such a case a single double frame only is used, in which the film coated on both sides is mounted. The glass or celluloid plate must then have holes corresponding to the registering pins on the frame.

In the case of an opaque white glass or celluloid-plate being used, a picture is obtained which may be viewed in reflected light in the same manner as a picture on paper.

COLOUR WORK is among the branches of photography to which special attention is to be paid by the recently formed "Scientific and Technical Group" of the Royal Photographic Society.

Correspondence.

**** Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

**** We do not undertake responsibility for the opinions expressed by our correspondents.*

THREE-COLOUR PHOTOGRAPHY.

To the Editors.

Gentlemen,—Mr. Handel Lucas's letter in the "B.J." of October 3, in reply to Mr. Yerbury's query, "Is Three-Colour a Blind Alley?" seems to tend only to thicken the haze which envelops this subject in the minds of even many experienced workers. I gather that Mr. Lucas is a process engraver, and as a member of the same interesting craft, I should like to state that while I have found all the faults in tri-colour work that he indicates, I have not found that they are in any way inconsistent with, or unexplained by, the scientific theory. Indeed, I find that it is only by referring to, and being guided by, that theory that these faults can be kept within limits.

The first point Mr. Lucas disputes is that the inks are the chief cause of faulty results, and refers to chromo-lithography to support his contention. I would like Mr. Lucas to take his most successful pre-war set of colour blocks, and re-prove them in the very best match he can get in inks now, or, if he repeats his statement to any good colour printer who is engaged in reprinting a sheet of pre-war colour plates, he will receive as direct and forcible a reply as he could desire. The reference to the results obtained by chromo-lithography has no point in this connection, for the "twelve to twenty various coloured ink impressions" he mentions are almost all light tints, and are very far removed from the very intense yet transparent inks required for printing three-colour. If Mr. Lucas wishes to see how the use of tints can improve tri-colour results (still quite along the theoretical lines) let him study some examples of American off-set work, such as the cover of the "Metropolitan Magazine."

Passing over Mr. Lucas's extraordinary statement, that emerald green is the one colour which cannot be produced in printing by some combination of red, blue and yellow, I come to his main point, which is a recommendation of a fourth plate printed in grey. Of the practical value of the grey printing I am very well aware, but I find it is required to make practical results attainable commercially, not because of any failure of the theory.

It would occupy too much space to go into the true use and advantages of the grey plate and the use of lighter colours, but this might be done at some future date, if the editor permits.

Nor do I propose to follow Mr. Lucas in his adventures amongst anatomical and psychological detail, beyond remarking that he is leaving what has yet to be proved other than solid ground for a region but vaguely mapped. It is very clear and comforting to study illustrations in text books, and talk about the "fine, delicate mosaic" of "rods and cones," but get the very best and clearest prepared section of the retina and compare it under the microscope with the convincing text-book figure and you will feel much less certain.

In conclusion, I would like to thank Mr. Yerbury and Mr. Lucas for opening the subject, and would point out that Mr. Lucas's demand on Mr. Butler means not only a grey plate (which has been made—without handwork—by Dr. Albert, and also by Mr. Gamble, of N.Z., though in both cases hardly practicable commercially), but also a means of preventing the grey parts from being recorded in the colour plates.

9, Albany Street, Edinburgh. WILLIAM B. HISLOP.

News and Notes.

THE GORSKY COLOUR PROCESS.—Some further particulars are given in the "Daily News" of November 4 last regarding the process of colour photography said to have been invented by Dr. S. M. Prokudin-Gorsky.

It is claimed that all the difficulties of colour photography have been overcome. One of the chief problems was to make the process capable of snap-shot as well as "time" work. This problem has been solved, and the exposure can be as rapid as with the ordinary emulsion—thus fitting the invention for cinema work.

It is claimed also that the amateur photographer will merely have to provide himself with a special camera designed for colour work and plates or films covered with a secret emulsion. After exposing in the ordinary way he will then have to reconcile himself to developing with three separate solutions, and printing will be rather more complicated than with the usual paper, but he is promised a result which will reproduce natural colours without any of the crudity of some colour processes.

The invention is in the hands of the Cinema Artists' Association, of Holland Park, who intend to develop it on an estate which they have bought at Byfleet and fitted with laboratories and studios. The cost of a colour film is expected to be only 15 to 20 per cent. higher than that of the ordinary black and white type. The special camera and plates will be put on the market.

REGISTERING PAGET TRANSPARENCIES.—Many novices, in endeavouring to register transparency and screen the first time or two scratch both before registration is obtained, and as this defect is one that it is quite impossible to cure, prevention is necessary. The surfaces of the transparency plate and of the screen are delicate, and there must be no dust between the two, and any roughness or dried-on particles of the films at the edges of the transparency should be carefully shaved off with a sharp knife or old safety razor blade. If they become detached during registration and get in between the two plates they may prevent perfect contact or cause scratches or abrasions. Mention should be made of the fact that it is the viewing screen that should be adjusted *on* the film of the transparency plate, and if care is not taken both films will be rubbing against each other, with the same result. One other point should be emphasised. When registering the viewing screen and plate should be held in exact line with the operator's eyes, for if held at an angle the picture may appear correct, but in reality, if viewed squarely, or in the case of a slide projected on the screen, false colours will be in evidence. After registration we attach three letter clips to the slide or transparency, and cement the two plates along all four edges with fish glue or other adhesive before commencing to bind them up, putting the plates aside with the clips still on, for the glue to get thoroughly dry before binding up. In this way there is no fear of losing the register during this operation, as often happens if this precaution is not taken.—R. M. F.

PAGET COLOUR PHOTOGRAPHY.—It is questionable whether those who practise this method of colour photography always obtain the beautiful results that this process is capable of giving. I therefore give a few hints from my own practise which may be useful. It is impossible to mask these transparencies in the ordinary, but the following is even better. Fixed-out lantern plates are taken and borders of different dimensions are drawn round with blocking-out compound. These are used to make negatives, consisting of an absolutely opaque centre. After a lantern plate has been exposed under the picture negative, one of these transparent border negatives is registered and a second exposure made. The transparency on development therefore has a black edging. I have also found difficulty occasionally in registering the transparency, although the negative on test is correct. This is due to bending of the negative when printed in an ordinary pattern frame. The cure for this is the type of pressure frame used by process workers. This is preferable in every way, as it is a guarantee that the little pattern on the negative is sharply reproduced. In fact, it is used for an almost similar reason by process engravers. I have also optically sealed a transparency and its screen together with Canada balsam, but the result was rather disappointing. Certainly parallax was reduced, but the result was no more brilliant than an unsealed picture. To those who wish to obtain the most perfect result regardless of time and money, I can recommend replacing a single exposure through the orange compensating filter by a triple exposure through the usual trichromatic set of filters. As soon as I have an opportunity I am trying a landscape by the above method, but replacing the red filter by a Wratten F (deep red) to produce a really artistic sky. I think the Paget Co. deserve an enormous amount of credit for keeping their process on the market during the war. I trust they will reap the reward now. I also hope they will persuade the camera makers to give us better dark slides. The ordinary book-form is not so bad, but still a lot of improvement is possible.—H. E. R.

No. 157. VOL. XII. DECEMBER 5,

THE BRITISH JOURNAL OF PHOTOGRAPHY

MONTHLY SUPPLEMENT

ON

Colour Photography.

CONTENTS.

Lantern-Slides by the Screen-plate Processes. By R. M. Fanstone PAGE 45 | Cellulose Ester cum Colloid Two-Colour Screen Films ..... PAGE 46

LANTERN-SLIDES BY THE SCREEN-PLATE PROCESSES.

In common with other branches of photography, there is no better means of exhibiting the fine qualities of good work than by projection of the image in natural colours upon the lantern screen. The ordinary transparency is, of course, not quite satisfactory when viewed in the hand, and every colour photographer is not in a position to instal an elaborate appliance for viewing. We are all of us familiar with the person who will persist in holding our favourite transparency in a position from which it is impossible to view it to the fullest advantage, and also, I think, have grown rather tired of answering the oft-repeated question, "When are you going to print it on paper?" The lantern-slide is, then, the solution of many problems. Among its advantages I may, perhaps, mention the following. It is economical, for, apart from the initial outlay, any number of duplicate lantern-slides by the Paget process may be produced for about one shilling each. The image is seen upon the screen without any difficulty, and gains to a marked degree by projection. A larger picture is shown than can be got in a transparency, and all its more subtle graduations of colour, which would be lost in an ordinary transparency, can be fully appreciated. It seems a pity, to my mind, that the lantern-slide in its best form, such as produced by the Autochrome and Paget processes, is to a great extent neglected. Such results as these offer are far in advance of the crudely coloured hand-painted lantern-slides in vogue years ago, and still widely employed. I was present some time ago at a lecture intended to set forth the delights and attractions of a certain colony. Some of the slides were monochrome, and the others obviously hand-coloured. All were more or less disappointing when compared with what colour photography would have done at its best. There is, I think and hope, a great future for the commercial lantern-slide, and perhaps some notes on lantern-slides by the screen-plate processes may prove helpful at the present time, and may also serve to induce those who may be turning their attention to colour photography to present their work in this way.

The preliminaries for colour photography, whether the results are to be exhibited as transparencies or slides, are much the same, except that with the latter a greater degree of technical perfection is demanded. I have seen slides that looked quite satisfactory when viewed in the hand as transparencies appear very indifferent when projected on a lantern screen, simply by reason of the fact that they possessed certain technical imperfections previously not observed. A sharp focus over practically the whole picture is usually required when slides are to be made, and for this reason a lens of fairly large aperture and short focal length is ideal, since stopping down is to be avoided as much as possible. Most of my own work is done by the Paget process with a $3\frac{1}{2}$ by $2\frac{1}{2}$ camera, using a lens of about $3\frac{1}{2}$ ins. focal length, working at $f/7.7$. This gives a general all-over sharpness at its full aperture, and rarely has to be stopped down further than $f/11$. It is most important that every shade and graduation of colour is properly rendered, or the best results will not be obtained. Care must also be taken with the Paget process to avoid slight degradations of colour in certain areas of the picture. These may easily pass unnoticed in a transparency held in the hand, but are apt to assert themselves to a greater degree on a large projected image. A well-backed negative plate will do much to avoid this, according to my own experience, and backing should always be done when making negatives for slide work.

A great deal of the success or failure of a colour slide will depend upon its density. It will be found with the Paget process a perfect negative is the finest possible foundation for a successful result. It is often assumed that if the negative is not quite as good as it should be, a good result may be obtained by a modification of the exposure and development when making the transparency. This, however, tends to upset the contrast and intensity of colour of a slide. Generally speaking, a lantern-slide in colours should be just a trifle more dense than a good monochrome slide, but it must be remembered that if the density is overdone, too great intensities of colour will be in evidence. If, however, the negative in the first instance has been correctly exposed—by this I mean it is better to err upon the full side, followed by correct development—there is little fear of falsification of colours. Too great a density may also bring into evidence slight effects of degradation of colours in the form of a faint halo where a strongly-lighted colour comes against the sky or another area of colour less well lighted. This effect may not be noticeable where there is less density in the plate. Autochromes intended for slides call for little special mention in this respect, as the procedure for a perfect Autochrome transparency is also identical for the production of perfect slides. The secret of success lies in giving a correct exposure to the plate in the first instance.

When transparencies by the Paget process are registered

with the object of their being viewed in the hand, it sometimes happens that by reason of the fact that the photographer held the transparency slightly at an angle, it is necessary to hold the plate slightly out of parallel with the eyes when viewing, to see the correct colours. This, in the case of an ordinary transparency, if only in evidence to a slight degree, is not a matter of any great moment, since adjustment is semi-automatic, but with lantern-slides there must be an entire absence of parallax if the projected image on the screen is to be correct. The photographer when registering must keep the two plates absolutely parallel in every direction with his eyes. If any difficulty is experienced in this direction it is an easy matter to construct a simple device that will ensure correct registration. A box should be constructed of about 2 ft. in length and of dimensions to take the slide at one end, with a means of holding the same. The other end of the box may be closed, save at the centre, where a hole is made, circular in shape, of about ¾ of an inch in diameter. The slide, after being registered with its viewing screen, is tightly held together with three or more "bull-dog" letter clips, and placed securely at its end of the box. Then if the photographer looks through the viewing hole, and keeps his eye close thereto, a glance will tell if a perfectly parallel registration has been made, the object of the box being to prevent any possibility of viewing the slide from an angle. The principle is something the same as that of a direct vision view-finder. Many photographers should be able to dispense with such a device, and it must not be thought that getting a perfectly parallel registration is a matter of great difficulty, since this is by no means the case. This point is an important one, and may seem obvious enough, but it is one that I know has often been overlooked until the slides were fully bound up and projected. Fortunately, if a slightly incorrect registration has been made, it is an easy matter to do the work again more carefully and correct the defect.

It is not possible to interpose a mask between the two plates in the case of the Paget process, as is generally done with monochrome slides, for this prevents perfect contact, making satisfactory registration impossible. This leaves but one position for the mask—*i.e.*, on the outside of the cover-glass, which is really the viewing-screen. I have seen slides masked by painting round the desired portions of the picture with a fixed Indian-ink, but this is not a very satisfactory method, and demands a certain skill in brushwork, to enable the job to be done properly. My own plan is to attach a built-up mask composed of strips of lantern-slide binder to the outside of the glass, and then to bind the slide again, in order to assist holding the masking strips; also this method lengthens the life of the binding. There is, of course, no objection to inserting a mask between an Autochrome slide and its cover-glass, and this, without doubt, is the best possible place for it. When the picture fills the slide there is no need to mask the plate if properly bound. Speaking of binding reminds me that the linen binding strips give far more satisfactory wear than do the ordinary paper ones, and are well worth the extra cost. They should always be employed with slides intended for constant use, commercial work, lectures, etc.

R. M. Fanstone.

CELLULOSE ESTER CUM COLLOID TWO-COLOUR SCREEN FILMS.

[Technical details are given in a recent patent specification, No. 129,717, of Mr. J. T. Smith, of a process of preparing mosaic two-colour filt r films of a degree of fineness which, it is claimed, is sufficient for the production of colour films for cinematograph projection. The following are the chief working details disclosed in the specification. In using the word "antichromatic" the patentee explains that he employs it in the sense in which it is used by Chevreul in the latter's "Laws of Contrast of Colour"—that is to say, in the meaning of "approximately complementary."—Eds. "B.J."]

The means by which a colour-screen base can be produced is, in general terms, as follows :—

(*a*) A surface of cellulose ester, or salt, as nitrate or acetate of cellulose is coated with small distributed areas of a fluid aqueous colloid preparation containing a transparent colour.

(*b*) The colloid areas if not already insoluble in cold water are, when necessary, or when an aqueous fluid is to be brought into contact therewith, insolubilised to water and the whole is thoroughly dried.

(*c*) The surface is treated for a short time with a solution of a colour approximately complementary or anti-chromatic to the tint or colour of the colloid preparation, the solvent being one which softens the cellulose ester but not the water-soluble colloid, which now forms a resist.

(*d*) Excess colour is blotted off or otherwise removed. Operations *c* and *d* may be repeated to obtain a right intensity of colour.

(*e*) The surface is treated with an appropriate fluid to remove traces of the second colour which adhere mechanically to the surface of the colloid areas; soured or acidulated water being generally appropriate when the solvent of the second colour is a fluid base, as aniline, for example.

(*f*) If at this stage either colour requires intensification to realise the requisite total general, or average, approximation to neutral tint, an aqueous solution of dye may be applied to colour the colloid further, or, alternatively, a stain appropriate to affect the cellulose ester may be applied. In the latter case, operation (*e*) may require to be repeated.

(*g*) The colour base, as produced at stage (*f*), will serve, when but two colours are required, the two colours being green and red or near variants. A third colour, blue, may now be added by cross ruling, random spraying, printing, or otherwise; this third colour being arranged to take or bite on one or both of the colours previously produced.

(*h*) The composite colour screen base may now be covered with a protective waterproof stratum, if required, and is ready for coating with sensitive emulsion. To isolate the colouring more completely from the emulsion the film of cellulose ester which carries the composite colour screen system may be stripped from its support and cemented colour-face downwards on any convenient support, or a thickness of cellulose resist may be built up on the screen as here described.

(*a*) Although ordinary celluloid or acetate celluloid may be used, the presence of additions, as, for example, camphor in indeterminate quantity and quality (degree of purification from the accompanying oil) may disturb operations, so, when practicable, the applicant prefers in the case of the finest screens to use a cellulose ester or a mixture of esters without the addition of camphor or other solid solvent. A somewhat stiff amyl-acetate collodion poured on a levelled glass slab forms a desirable base for operation, and a convenient method of retaining the film of ester on the glass is to lay an edging of indiarubber on the margin of the face of the plate which is to be coated, as by painting an edging on the face of the glass with the official "liquor caoutchouc" or indiarubber solution of the 1898 edition of British Pharmacopœia. Otherwise the whole surface of the glass plate may be rubbered, and in this case the purest benzene without any sulphur compound may be desirable. The stratum of cellulose ester being thus obtained and conveniently supported on a level and rigid support of glass, the surface is then plotted out or partly covered as a lined or stippled system, with a colloid material charged with a suitable soluble colour, the colour

being red or reddish when the second colour for staining the ester is green or greenish. On the other hand, the colour in the colloid mixture may be green or greenish, in which case the second colour for staining the bare parts of the ester should be red or reddish.

The quality of the pyroxyline used for this purpose is a matter of some importance. The officinal "pyroxyline," prepared according to the official instructions on page 323 of the 1914 edition of the British Pharmacopœia, is quite satisfactory, but most samples of tough or "low temperature" nitro-cottons of commerce, or "surgical" pyroxylines may serve. Perfect solubility and toughness are the leading criteria.

Pyroxyline as specified	100 grs.
Amyl acetate	4 fl. ozs.

About 100 grains of this collodion or solution may be used as the dose for coating a quarter-plate (3¼ by 4¼ ins.), this giving a desirable thinness of film when the finest lines or grains are to be formed, whereby obviously lateral penetration or diffusion of the stain under the colloid lines is so minimised as not to injure or darken the colour combination by overlap of colour.

COLLOID MIXTURE OR INK FOR LINES OR GRANULATION.

RED.

Para-rosaniline colour-base	12 grs.
Water	240 grs.
Glacial acetic acid	10 grs.
When all is dissolved add:—	
Fish glue	140 grs.

Excess of acetic acid should be avoided, as also the use of fish glue, which is acid, as acidity of the mixture may cause the aniline solution (or like solution) of green dye to adhere to the lines.

Para-rosaniline colour-base (as distinguished from para-rosaniline leuco-base) is regarded by chemists as tri-amino-phenyl-carbinol, and applicant believes that this is the colour base of the dye known in commerce as "diamond magenta." To be specially appropriate for use in relation to the invention the para-rosaniline colour base should be free from phenyl or alkyl substitution products which give a bluish cast to the colour. An ordinary rosaniline base or similar base may be used, but in preparing the colour the crimson cast should be preferred. Crimson colours of the nature of magenta are well known to experts in aniline colours.

The fish glue used is the semi-fluid kind sold commercially as "Le Page's special photo-engraving glue for process work." This is understood to be guaranteed as free from acid.

GREEN COLLOID SOLUTION.

"Acid green colour" of commerce	10 grs.
Water	55 grs.
Add the following mixture:—	
Fish glue (as noted above)	40 grs.
Water	50 grs.

Any undue acidity should be avoided, as in the case of the red colloid mixture and all such mixtures. The colloid inks for the purpose of the invention may be coloured to suit whatever colour combination is selected for the composite colour screen, the selection being according to well-known principles. The colour must, however, be soluble in water.

Alternatively, the colloid mixture may be uncoloured, and after the lines or areas are insolubilised they may be coloured by the use of an aqueous solution of dye, as explained below.

(*b*) To insolubilise the fish glue ruling, the ruled plate is by preference exposed to the vapour of formaldehyde, conveniently from an aqueous solution of formaldehyde; another method is to add a soluble chromate to the ruling ink or mixture, and to allow time or light, or both, to bring about insolubility of the dry lines.

Insolubilisation of fish glue areas in a vapour bath of formaldehyde has been touched upon, but, if desired, the formaldehyde vapour bath may be used for a supplementary hardening: alternatively a formaldehyde liquid bath may be used for any colloid areas or lines which are not immediately soluble in cold water. For the first stage in insolubilising the areas of unchromated fish glue, the formaldehyde vapour is of great value, as it in no sense or degree impairs the sharpness or perfection of the marginal parts of the areas.

After insolubilisation, and before the next stage (*c*), the gelatinous areas should be thoroughly desiccated, this being conveniently done by slight warmth or by leaving the surface for a time in a cold drying box containing chloride of calcium.

(*c*) The solvent of the staining fluid should be of such a nature as to penetrate, soften, or incipiently dissolve the bare surface of the cellulose ester, but not so active as to attack or soften the colloid areas in any way, in the sense of making the base so pasty or soft as to bring about removal of the lines or areas of resist material.

Ordinary alcohol, methyl alcohol, and acetone as such, and, while anhydrous, fulfil the above conditions, but as in drying or evaporating these solvents absorb moisture, their use often or generally involves a slight subversive staining of the colloid areas, the aqueous residue drifting over to the colloid resist and staining it.

A solution of aniline colour in aniline itself is well known as an ink for writing on celluloid, and is especially suitable, as the surface of the colloid areas is not stained or attacked, provided that the herein stated precautions are observed.

Solutions suitable for the purpose of the invention are as follows:—

1.	Aniline of the grade sold commercially as "analytical reagent" or A.R.	100 grs.
	"Acid green" aniline colour	12 grs.
2.	Aniline, as above	100 grs.
	"Methyl red" aniline colour	4 grs.

The plate bearing the stratum of cellulose ester, on which are greenish or reddish lines of colloid, as described, having been well desiccated, is quickly and uniformly brushed, or mopped, or soft-rollered over with the green or the red dye dissolved in aniline, the green solution being used if the colloid lines are red, and the red solution being used if the colloid lines are green.

(*d*) After a short interval, 3 to 30 seconds, for example, the excess is blotted off with a short pad, and, if necessary, other similar applications and blottings off follow. By several short treatments, as contrasted with one prolonged action, the tendency of the dye to penetrate laterally or obliquely under the colloid lines is diminished. The adjustment of the activeness of the solvent in relation to the quality of the base of ester or celluloid is an important aspect of the invention. As above stated, the purer aniline sold as "analytical reagent" is the preferred sol- such a case one procedure is first slightly to soften the surface of film consisting of the pure cellulose ester (cellulose nitrate) as deposited from the solution in amyl acetate. This purer aniline is also suitable for many, or perhaps most qualities of commercial celluloid film, but the applicant has met with qualities so resistant to the action of pure aniline as a solvent that endeavours to stain the material with the aniline solutions given above were futile. In such a case one procedure is first slightly to soften the surface of the celluloid with methyl alcohol, amyl acetate, or acetone, and then to apply the solution of dye in aniline. Alternatively, the above-mentioned solvents may be mixed with the aniline solution of the dye.

In the case of a quality of celluloid which is extremely resistant to solvents, nitrobenzene may be used in a similar way to increase the solvency of the aniline. In an extreme case the staining dye may be dissolved in the pure nitrobenzene, but in all ordinary cases the solvent or softening powers of such a solution would be excessive.

In the use of nitrobenzene, especially by itself, there may be some care required in selecting a suitable colour, but the inventor found malachite green to dissolve readily in a sample of nitrobenzene which he had purified to the utmost. This solution kept well for a few weeks, and instantly stained the hardest celluloid of the applicant's selection.

(*e*) It is now generally expedient to remove the excess of aniline by soaking the plate in weak sulphuric acid for about four minutes; one weight unit of sulphuric acid to from 20 to 100 weight units of water being convenient. The plate is now washed and dried. This treatment in the acid bath also tends to remove any trace of the aniline mixture which may adhere to the surface of the colloid resist. Other rinsings appropriate to the stain and its menstrum may be used.

(*f*) To intensify the colloid areas, an aqueous solution of an aniline dye should be used, and the plate should be thoroughly dry in order that the film of ester may become hard and compact, so as not to take colour readily from an aqueous solution. That the pyroxyline or ester should be of the tough kind rather than pulverulent or soft kind is sufficiently indicated above. In intensifying the stain on the cellulose ester surface, care should also be taken that the plate is completely dry. The process of intensification is merely another operation as detailed under the heading. By using a suitable dye, tint (as also intensity) may be modified by the intensification.

(*g*) The instructions so far serve to produce a composite colour screen in two colours, the third colour, if required, being added afterwards, either as an independent blue ruling, lining, or spraying, which impartially takes upon both elements of the two-colour screen, or, alternatively, the blue colour may be made discriminative in the following manner :—

Let it be supposed that the green areas are produced in the film of cellulose ester and that the red colour is embodied in the colloid areas. If now a solution of aniline blue in aniline, or its technical equivalent, as herein indicated, is ruled or sprayed, and, after blotting off, the plate is treated in the above-mentioned souring bath, the blue colour will take only on the green where it will be especially required, and will not take on the colloid surface charged with red. Alternatively, if the colloid lines are green, an aqueous solution of blue dye, with or without the addition of a water-soluble colloid, may be sprayed or ruled as a scattering over the whole surface, and on rinsing off with water the blue will leave its impress most notably or entirely on the green colloid lines. The tints or colours involved in this kind of discriminative treatment may be varied according to the requirements of the colour scheme.

When the blue is to cross the green, or partly cover the green, an original green of a yellower tint is indicated than when the green is to form part of a two-colour system; on the other hand, when the greenish colour of the two-colour system is a greenish blue (alternatively a bluish green), the third colour applied in any of the above modes (discriminative or general) may be yellow, instead of blue, as specified. In this case the yellow over the greenish-blue gives green by abstraction or obstruction, leaving the uncovered portions of the greenish blue to form another element of the combination.

(*h*) An especially expedient course when flexible surfaces or "films" are required for exposure in the camera is to strip the composite colour screen as prepared on a glass support and to mount the stripped composite colour screen ester side upwards, on ordinary celluloid, this giving an inert or non-active side for coating with the sensitive emulsion. For this purpose the receiving surface of celluloid should be made slightly adhesive as by a thin coating of amyl acetate collodion, and the stripped composite colour screen is pressed, colour side downwards, into close contact and adhesion. In this operation the least practicable quantity of adhesive should be used, so as to minimise any interdiffusion or overlap of colour. Heat may be employed with the pressure, or alternatively heat and pressure may be employed without any adhesive. Instead of applying adhesive as such, the celluloid or ester surface may be moistened or fumed with a solvent, as, for example, amyl acetate.

Successive thin coatings of celluloid varnish or cellulose ester varnish, prepared, for example, with amyl acetate as a solvent as hereinabove specified, may now be applied, thorough drying being effected between the applications. Thus is built up any required thickness of inert protective material between the composite colour screen and the emulsion, or the composite colour screen and any chemical used in after-treatment. The reason for using successive thin coatings is to prevent such softening of the whole mass as may lead to subversive inter-diffusion of the colours, and, if desirable, a thin stratum of indiarubber or resinous material may be used between any two coatings. The operation of transfer makes it practicable to thicken the back or the front of the original film of cellulose ester, but where no transfer is made the indiarubber substratum may conveniently cover the whole surface of the glass plate instead of being confined to the edges.

Although aniline is mentioned as a desirable solvent for such colour as is used to stain the cellulose ester, other solvents may be used, the whole range of what may be vaguely termed alcoholic, etherial or aromatic solvents being more or less available, and the solvent must be selected in reference to the colouring body used. Preference is, however, given to basic solvents which are physically and chemically comparable to aniline, removal in an acid bath being easy; and in this connection may be mentioned the liquid toluidines (ortho-toluidine and meta-toluidine), whether alone or with aniline.

It should be understood that the composite colour-screen produced as herein described, by interdependent colouring and staining in stages, may be formed on ordinary thin celluloid or on similar sheets of cellulose ester without camphor, either after manufacture or while the celluloid is with or on the moulding plate or moulding wheel, and emulsion may be laid on either side of the stripped sheet as may be expedient.

In all heliochromic processes it may be expedient to introduce a neutral key element to conduce to critical sharpness and also intensity. One way in which a neutral key can be associated with results by the present process is to superimpose a weak monochrome taken actually from the same standpoint, any suitable or known optical device being used for this purpose. Another mode suited for cinematograph projection is to produce alternately heliochromes, by the herein described process, and monochromes on the same film, a lens of higher or deeper defining power being preferably used for the monochrome alternations. In the final or exhibition film the heliochromes and weak monochromes would be cast on the screen in alternation.

A Dye-Image Colour Process.—Particulars are given in the "Patent Journal" of the process of J. H. Christensen (patent No. 133,034), now open for inspection under the International Convention. For producing dyed images, advantage is taken of the catalytic effect of the finely-divided silver of an image on the action of reducing agents on certain dyes. A bromide plate is dyed with oxaminerosa, exposed, developed, fixed, and then treated with a powerful reducing agent, such as sodium hydrosulphite or stannous chloride, which has the effect of bleaching the dye where the silver is deposited. The silver is subsequently removed by chromic acid or Farmer's reducer, leaving a clear colour picture. Alternatively, the development and bleaching can be effected simultaneously by treating an exposed plate in a bath containing sodium hydrosulphite and potassium bromide, the silver and any silver bromide being subsequently removed by Farmer's reducer. Alternative dyes of the dianile class are given, some of which—for example, Chicago blue—require to be subsequently mordanted. Toned silver images can be treated similarly.

The Prokudin-Gorsky Colour Process.—Technical particulars of this process, which has been the subject of news paragraphs in the daily Press, are now ascertainable in this country from the series of patent specifications which have been filed at the Patent Office under International Convention, and, under that Convention, are open to public inspection before acceptance. These specifications are as follows :—

18,585.—Production of coloured diapositives. November 9, 1918. 135,161.

23,437.—Apparatus for the treatment of articles such as photographic negatives with liquid. November, 9, 1918. 135,165.

23,718.—Printing apparatus for the production of diapositives. November 9, 1918. 135,166.

23,933.—Apparatus for closing of a circuit for a certain period. November 9, 1918. 135,167.

24,336.—Photographic camera for taking part negatives for pictures in natural colours. November 9, 1918. 135,169.

24,982.—Apparatus for the production of coloured cinematograph films. November 9, 1918 135,171.

In each case the number first given is that for the year 1919 allotted to the specification during its passage through the Patent Office. The number following the title of the patent is the serial number according to the system introduced a few years ago. The date in each case is that claimed under the International Convention, being the date of the first foreign application.

TR
1
B8
v.66
[redacted]
ENGINEERING

The British journal of photography

PLEASE DO NOT REMOVE
CARDS OR SLIPS FROM THIS POCKET

UNIVERSITY OF TORONTO LIBRARY

ENGIN STORAGE